United Nations Department of Economic and Social Affairs
Division for Sustainable Development

Sustainable Development in the 21st Century (SD21)

Review of implementation of Agenda 21 and the Rio Principles

Detailed review of implementation of Agenda 21

January 2012

DRAFT

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Acknowledgement

This study is part of the Sustainable Development in the 21st century (SD21) project. The project is implemented by the Division for Sustainable Development of the United Nations Department of Economic and Social Affairs and funded by the European Commission - Directorate-General for Environment - Thematic Programme for Environment and sustainable management of Natural Resources, including energy (ENRTP).

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This publication has been produced with the assistance of the European Union. The contents of this publication are the sole responsibility of the United Nations Department of Economic and Social Affairs and can in no way be taken to reflect the views of the European Union.

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Introduction

This report is one of three companion reports produced under the first study of the "Sustainable development in the 21st century" (SD21) project, an undertaking of the Division for Sustainable Development of the United Nations Department of Economic and Social Affairs (UN DESA).

The overarching objective of the SD21 project is to construct a coherent vision of sustainable development in the 21st century. The project, funded by the European Commission - Directorate-General for Environment, aims to provide a high quality analytical input to the Rio+20 conference.

The United Nations Conference on Sustainable Development (UNCSD), which will gather UN member states and other stakeholders in Brazil in 2012, is a key occasion to take stock of 20 years of action at all levels to promote sustainable development, and to provide a clear vision and way forward for the international community, national governments, partnerships and other stakeholders in implementing the sustainable development agenda in an integrated manner.

The SD21 project is built around a series of studies that will inform a synthesis report, "Sustainable development in the 21st century" (SD21). The SD21 body of studies is expected to become an important analytical and political contribution in its own right. Studies under the SD21 project will cover the following topics: assessment of progress since the Earth Summit; emerging issues ; long-term sustainable development scenarios; tools for managing sustainable economies; national and international institutions for sustainable development; and sector assessments.

Implementation of Agenda 21 and progress in implementation of the Rio principles

Twenty years after the Rio summit, this first study aims to provide an assessment of the progress and gaps made in the implementation of some of the Rio outcomes, specifically, Agenda 21 and the Rio Principles.

The study comprises of three outputs:

- Detailed review of progress in implementation of the Rio Principles
- Detailed review of implementation of Agenda 21
- Synthesis report on implementation of Agenda 21 and the Rio Principles.

Implementation of Agenda 21

When it was adopted in 1992 at the earth Summit, Agenda 21 - "a programme of action for sustainable development worldwide" as stated in its Introduction, had the ambition of being "a comprehensive blueprint for action to be taken globally, from now into the twenty-first century". The ambition was high, and so were the stated goals of the Agenda:

- improving the living standards of those in need;

- better manage and protect the ecosystem;
- bring about a more prosperous future for all.

Various chapters of Agenda 21 have progressed at different paces. Information on progress and gaps in the implementation of SD commitments and decisions exist, but is often scattered. On some of the topics, global assessments have been undertaken by the international community (IPCC reports; Global Energy Assessment; IAASTD for agriculture). Academic institutions and think tanks often produce reports on specific sectors or topics (e.g. oceans, renewable energy, climate change).

Short reviews of the state of implementation of various chapters or clusters of chapters of Agenda 21 were produced by the UN for the Commission on Sustainable Development sessions in 1997 ("Rio+5") and 2001 in preparation of the 2002 World Summit on Sustainable Development. These reviews, which were 5-10 pages long, were produced by the UN agencies in charge of specific chapters of Agenda 21 according to the arrangements agreed by the now extinct Inter-Agency Committee on Sustainable Development.

The UN Division for Sustainable Development regularly undertakes reviews of progress made under the clusters of issues in different CSD cycles, in the form of both issue-specific (sectoral) reports, so-called "overview reports", and trends reports. Since the Trends report produced by DSD for the World Summit on Sustainable Development in 2002 there seems to have been no fully-encompassing review exercise done by the Division for Sustainable Development.

This study aims to provide a systematic, although not by any means fully comprehensive, assessment of the progress and gaps in the implementation of the programmes of action included in the 40 chapters of Agenda 21.

The study is aiming to complement existing exercises of the types mentioned above, by:

1. providing a basic but systematic coverage of issues in Agenda 21 (by opposition to a subset of issues under each CSD cluster), including state of progress, institutional changes since 1992, outstanding issues that were either not included in Agenda 21 or rose to major importance since then;
2. assessing the main factors having caused progress or lack of progress on the different chapters, and suggesting alternative approaches to facilitate faster progress;
3. and synthesizing the lessons from the detailed examination of the chapters of Agenda 21 and suggesting priorities for progress across the board.

The reader is invited to access the two other reports produced under this study, namely the detailed review of implementation of the Rio Principles and the synthesis report on implementation of Agenda 21 and the Rio Principles.

Methodology

The Division for Sustainable Development commissioned Stakeholder Forum for a Sustainable Future (SF) to undertake this review to provide an assessment of the progress and gaps made in the implementation of two key Rio outcomes; Agenda 21 and the Principles of the Rio Declaration.

Stakeholder Forum has a strong institutional memory that spans over two decades and has been deeply engaged in the processes that were developed out of the UNCED in 1992 — such as the CBD conferences as well as the UNFCCC negotiations and myriad other conferences both organised by the UN and other stakeholders (NGOs, local authorities, trade unions, youth, etc.).

The terms of reference for the study included:

- A comprehensive review of each of the Chapters of Agenda 21 and the Rio Declaration Principles;
- A synthesis report that offers and overview of the successful implementation of the above; as well as areas that have been a barrier or challenge to implementations; and
- A table or traffic light system to 'score' each of the Chapters and Principles to offer a quick reference to the status of implementations.

The work was carried out between May and November 2011. Stakeholder Forum used both in-house capacity and external consultants with particular policy expertise to undertake the review.

Based on the terms of reference, Stakeholder Forum developed a generic template for the review of each of the individual chapters and principles to streamline the process that was conducted by multiple people; and to ensure consistency in the research and writing approach. The template is outlined in more detail below.

Agenda 21 and Rio Principles drafting template

Introduction
This section should set the context, why the principle is important, what factors gave rise to it.

Implementation
This section should analyse the status of implementation of the principle globally, including the following:

- A broad and brief analysis of global implementation i.e. how prevalent the principle is in global and national decision-making, policy and law, the main drivers
- Examples of regional and national implementation (specific case studies only, a full-scale analysis of national implementation will not be possible)
- Examples of global, regional and national instruments, including evaluations of efficacy of instruments where possible
- An overview of the key actors and organisations that have influenced progress towards implementation, their past, ongoing and future campaigns

Challenges and Conflicts
This section should focus on some of the challenges to implementation of the Principle more generally, including:

- Disparities in the application of the principle across UN Member States, including an analysis of political, economic, cultural and industrial interests that might influence this
- Conflicting policies and legislation globally e.g. World Bank, IMF, WTO
- Interest groups and actors that are opposed to the implementation of the principle

The Way Forward
This section should provide an analysis of the possible 'way forward' for the Principle, based on the author's own analysis of the 'state of the debate' but also referring to views of experts in the field. It should include the following:

- Identification of further steps that could be taken to more fully implement the Principle in

question

- Identification of the trade-offs associated with the Principle that must be addressed
- Identification of particular actors (where relevant) whose approach will need to change
- Identification of prevailing social, political, environmental and economic drivers which will influence the likelihood of implementation.

Stakeholder Forum conducted the initial drafting in-house for each of the 39 Agenda 21 Chapters and 27 Rio Principles. This was done by a core team of researchers familiar with the area of work. Once initial drafts had been completed these were sent to DSD for comment and review and to identify gaps in the reports as well as to emphasise areas of focus and discuss areas that needed particular attention. Once feedback was received Stakeholder Forum engaged expert consultants to take the initial research and compile a more focussed and detailed analysis of particular Chapters and Principles. Stakeholder Forum then played a coordinating and editorial role, receiving updated versions of different chapters and principles, and editing these for content and style before finally submitting them to UN DESA.

The study is based on desk review of the existing literature, including academic (peer-reviewed) literature, UN decisions and official reports, evaluations and assessments published by international think tanks and policy institutions, and others as relevant. This had its limitations, and these must be acknowledged.

Where possible case studies were drawn upon to illustrate successful implementation or where barriers and challenges to implementation existed. These case studies are intended to be illustrative. While attempt has been made to cover a range of examples and to offer a divergent set of views in the case studies, time and resources did not allow for a full and comprehensive review of every example.

The structure of this report follows that of Agenda 21. Agenda 21 was divided into 4 sections: Economic and Social issues; Conservation and Management of Natural Resources for Development; Strengthening the Role of the Major Groups; and Means of Implementation.

The initial drafts of the chapters covering section 3 of Agenda 21 (Strengthening the Role of the Major Groups, chapters 23 to 32) were drafted based on inputs and sources coming in great part from Major Groups organizations involved in UN processes. Although the initial drafts have been complemented by other sources and have evolved significantly for some chapters, many of them retain a strong component of their initial content. For this reason, the section on Major Groups is, much more than the rest of this report, focused on what is done by international Major Groups networks in particular with respect to their involvement in UN processes, from their own perspective. This section does not pretend to be a completely objective, distanced perspective on the successes and challenges related to the involvement of various components of civil society, business and local governments in sustainable development since the Earth summit.

Section 1:
Social and Economic Dimensions

Chapter 2: International Cooperation to Accelerate Sustainable Development in Developing Countries & Related Domestic Policies

Introduction

Chapter 2 of Agenda 21 focuses on achieving sustainable development through increased international cooperation in four broad areas — the need for the international trading system to consider the inclusion and needs of developing countries; assistance in the creation of developing countries' domestic policies in order to maximise the benefits of the proposed trade system and a diversification of their commodity sectors; attention to the amount of Overseas Development Assistance (ODA) developing countries receive and the reconsideration of their indebtedness; and to ensure, as the overall aim, that the international trading system is not only fair and just, but that it provides development opportunities for the Least Developed Countries (LDCs) in a way that is protective of the environment and that lifts people out of poverty in a sustainable manner[1].

Implementation

Trade Liberalisation

Coming out of over a decade of structural adjustment programmes, import substitution and protectionist market approaches with little to show in the way of development but macroeconomic crises, the move towards trade liberalisation at the beginning of the 1990s was viewed as a promising trend by most developing countries. It was especially welcome after a decade of protectionist market approaches - combined with structural adjustment programmes[2] - had precipitated a number of macroeconomic crises and had failed to contribute to wider development objectives[3]. For trade liberalisation to work, it was purported at the time that it needed to be coupled with a heightened sense of international community and cooperation in terms of ODA, technical and policy assistance for domestic market changes, and moves to overcome the dichotomy between trade and environmental protection. With the Cold War coming to an end, the provisions in Agenda 21 represented an important step towards achieving trade liberalisation in the interest of developing countries.

The World Trade Organisation (WTO) with its focus on trade liberalisation has resulted in a reduction in overall global import tariffs and other protectionist measures since its inception in 1995[4]. The majority of developing countries have embraced the reforms of the WTO regime and in Africa, for example, the number of countries with open trade regimes

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[1] UNDESA DSD (2009) SD Topics: Trade. URL: www.un.org/esa/dsd/susdevtopics/sdt_trade.shtml [accessed 22.06.2011]; The World Bank Data News: World Development Indicators (WDI) 2010 Released, URL: data.worldbank.org/news/world-development-indicators-2010-released [accessed 21.06.2011]

[2] "Structural Adjustment Programmes (SAPs) were promoted in the early 1980s by the World Bank and IMF and contain economic policies for developing countries that follow the neo-liberal globalisation ideology with the aim to achieve long term or accelerated growth by restructuring the economies of developing countries and reduce government intervention thus opening up their markets. The provision of loans were conditional on the adoption of these policies, which included, currency devaluation, managed balance of payments, increased free trade, lower tariffs on imports and tighter monetary policy, increased free trade, and privatisation of the state and industries". (WHO – Trade, Foreign Policy, Diplomacy and Health: Structural Adjustment Policies http://www.who.int/trade/glossary/story084/en/index.html)

[3] Rodrik, D. (1992) The Limits of Trade Policy Reform in Developing Countries, *Journal of Economic Perspectives*, (6):1, 87-105 p.89

[4] OneWorld.net Trade and Poverty Guide, November 2010, URL: uk.oneworld.net/guides/trade [accessed 22.06.2011]

increased from 7 in the 1980s to 25 in the late 1990s[5], and now most developing countries have very open trade regimes[6]. However, these efforts have not been reciprocated to the necessary level by OECD countries, and the effects have been quite uneven for developing countries[7]. The Doha Round of negotiations, which started in 1994, should have resulted in development-focused outcomes surrounding trade rules, especially in the agricultural sector, but there has instead been a stale-mate in discussions for over half a decade - with no resolution on the horizon. The main contention of this stale-mate relates to the need for the US, EU and Japan to reduce their agricultural subsidies in order to create more market access for developing countries[8].

Overall, these trade distorting subsidies have declined over the past two decades as a percentage of GDP and in 2008 they fell to 0.84% from 0.88% in 2007[9]. However, at a current value of US$376 billion, the subsidies still present a significant barrier to developing countries' efforts to increase their share of the market in agricultural commodities, and thereby reduce poverty levels[10]. To illustrate this point, trade itself has been growing at almost 10% per annum, apart from during the 2009 recession, but LDCs only partook in less than 1% of overall trade in 2008, half of which was in oil[11]. The uneven progress that has been made towards MDG 1[12] — eradicating extreme poverty and hunger — may be partly attributable to the reliance of most developing countries upon their agricultural exports which cannot currently compete in the global market. As such, many are sceptical of the genuine commitment of developed countries towards true trade liberalisation[13].

Aid for Trade

International cooperation and the recognition of the trade needs of developing countries has been shown through aid-for-trade schemes and the Generalised System of Preferences[14] such as the EU Everything But Arms (EBA) initiative adopted in 2001[15] and the US African Growth Opportunities Act (AGOA) adopted in 2000[16] which both offer duty- and quota-free access to a wide range of developing country produce and enabled 81% of

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[5] FAO (2003) Trade Reforms and Food Security: Conceptualizing the Linkages; Commodity Policy and Projections Service, Commodities and Trade Division, Rome
http://www.fao.org/docrep/005/y4671e/y4671e00.htm

[6] UNCTAD and UNDP (2007) Globalisation and the Least Developed Countries: Issues in Trade and Investment, Making Globalisation Work for the LDCs, Istanbul, 9-11 July 2007; United National Ministerial Conference of the Least Developed Countries, p.4. URL: http://www.unohrlls.org/UserFiles/File/LDC%20Documents/Turkey/Trade%20and%20Investment.pdf

[7] FAO (2003) Trade Reforms and Food Security: Conceptualizing the Linkages; Commodity Policy and Projections Service, Commodities and Trade Division, Rome, p.38
http://www.fao.org/docrep/005/y4671e/y4671e00.htm

[8] MDG Gap Task Force Report (2010), Millennium Development Goal 8: The Global Partnership for Development at a Critical Juncture, United Nations, New York
http://www.un.org/en/development/desa/news/policy/mdg-gap-2010.shtml

[9] MDG Gap Task Force Report (2010), Millennium Development Goal 8: The Global Partnership for Development at a Critical Juncture, United Nations, New York
http://www.un.org/en/development/desa/news/policy/mdg-gap-2010.shtml

[10] MDG Gap Task Force Report (2010), Millennium Development Goal 8: The Global Partnership for Development at a Critical Juncture, United Nations, New York, p.xii
http://www.un.org/en/development/desa/news/policy/mdg-gap-2010.shtml

[11] OneWorld.net Trade and Poverty Guide, November 2010, URL: uk.oneworld.net/guides/trade [accessed 22.06.2011]

[12] OneWorld.net Trade and Poverty Guide, November 2010, URL: uk.oneworld.net/guides/trade [accessed 22.06.2011]

[13] Achterbosch, T.J., ben Hammouda, H., Osakwe, Patrick N. And van Tongeren, F.W. (2004) Trade Liberalisation Under the Doha Development Agenda; Options and Consequences for Africa, Agricultural Economics Research Institute (LEI) Report Series http://purl.umn.edu/29104

[14] The Generalised System of Preferences was established in the 1970s as the process whereby selected products originating in developing countries are granted reduced or zero tariff rates; and the Least Developed Countries (LDCs) receive special and preferential treatment for a wider coverage of products and deeper tariff cuts. UNCTAD http://www.unctad.org/Templates/Page.asp?intItemID=2309&lang=1

[15] European Commission http://ec.europa.eu/trade/wider-agenda/development/generalised-system-of-preferences/everything-but-arms/

[16] Afican Growth and Opportunity Act, URL: www.agoa.gov

developing country exports (excluding arms and oil) to enter developed countries in this way in 2008 — a small increase from 78% in 1998[17]. However, this figure has been somewhat static since 1996, and only goes some way to meeting the MDG target of 97% by 2015[18]. Overall aid-for-trade commitments increased 35% in real terms in 2008 but there are worries that the benefits are concentrated in only a few countries[19].

ODA

Globally, aid flows were reported to have been at an all time high of US$120 billion in 2009 but this actually translated into an increase of less than 1% in real terms between 2005 and 2009 and is a shortfall of over US$20 million annually to the Gleneagles G8 agreement made in 2005. The share of ODA currently pledged is only 0.31% of donor GNI, well below the UN target of 0.7%. This target has only been reached and exceeded in 5 donor countries[20]. The Paris Declaration on aid effectiveness was adopted in 2005 and contains five core principles based on previous experience of what works and what does not work in development and that enable aid recipients to forge their own National Development Plans. The five principles are ownership, alignment, harmonisation, results and mutual accountability. The Accra Agenda for Action (AAA) in 2008 aimed to strengthen and deepen the impact of the Paris Declaration and set an agenda for stronger ownership, inclusive partnership and delivering of results, and capacity building[21]. Importantly, these initiatives deal with the issue of conditionalities through encouraging developing country ownership and alignment such that any conditionality should be based on the domestically produced National Development Plan[22].

Debt Relief

Many efforts have been made over the last two decades to overcome the restrictions that international debt, described by some as a "new form of slavery"[23], is playing in the development of developing countries. Thirty-two countries have had their debt to the World Bank, IMF and African Development Bank cancelled through the Multilateral Debt Relief Initiative (MDRI), resulting in a saving for them of between US$600 million — US$1 billion. In ideal cases this saving has been reinvested into public services such as healthcare and education (Box 1). However, there are still many countries that have not benefitted from this initiative, and they continue to pay off billions in debt each year[24] (Box 3).

Environment and Trade

Since Agenda 21, multilateral environmental issues have risen to prominence and the relationship between trade and these environmental concerns have been dealt with in a variety of ways. A number of Multilateral environmental agreements (MEAs) utilise trade barriers as a means of prohibiting environmentally damaging activities i.e. ensuring tuna is

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[17] Millennium Development Goal Report 2010, UNDP, p.68
http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf

[18] OneWorld.net Trade and Poverty Guide, November 2010, URL: uk.oneworld.net/guides/trade [accessed 22.06.2011]

[19] MDG Gap Task Force Report (2010), Millennium Development Goal 8: The Global Partnership for Development at a Critical Juncture, United Nations, New York, p.xii
http://www.un.org/en/development/desa/news/policy/mdg-gap-2010.shtml

[20] MDG Gap Task Force Report (2010), Millennium Development Goal 8: The Global Partnership for Development at a Critical Juncture, United Nations, New York, p.x
http://www.un.org/en/development/desa/news/policy/mdg-gap-2010.shtml

[21] OECD Development Cooperation Directorate
http://www.oecd.org/document/18/0,3343,en_2649_3236398_35401554_1_1_1_1,00.html

[22] Aid Effectiveness - http://www.aideffectiveness.org/Themes-Conditionality.html

[23] Make Poverty History, Debt Relief. URL: www.makepovertyhistory.com.au/debt-relief/ [accessed 22.06.2011]

[24] The Jubilee Debt Campaign, URL: www.jubileedebtcampaign.org.uk/multilateral%20Debt%20Relief%20Initiative+902.twl [accessed 21.06.2011]

caught in a dolphin friendly manner or banning the trade in endangered species (CITES) (Box 2). Of the approximately 200 MEAs about 20 of them use trade restrictive measures[25]. The WTO has an inbuilt exception clause under Article XX in which trade restrictions are allowed when relating to the conservation of exhaustible natural resources[26], but the dispute settlement process has been a serious area of contention with many believing that MEAs are inherently contradictory to the WTO's principle of non-discrimination especially when it comes to non-signatories of the MEA. However, until now very little action has been taken against any trade restrictions imposed by MEAs for breaking WTO rules[27].

Box 1: Impact of Debt Relief

Mozambique. Debt relief enabled $18.5 million to be spent on health - half a million children were immunised for free against tetanus, whooping cough and diphtheria.

Tanzania. Reduced country's debt burden to 54% (>US$2 billion) in 2001. Funds were used on healthcare and education. 1.6 million more children were able to go to school for the first time.

Zambia. 78% debt cancellation in 2006. Declared free access to healthcare in rural areas.

Benin. 52% of money saved through debt relief has been spent on health including rural primary health care and HIV programs.

- Make Poverty History

Box 2: CITES

CITES is an international agreement between governments which entered into force in 1975. It aims to ensure international trade in specimens of wild animals and plants does not threaten their survival. Annual international trade is estimated to be worth billions of dollars and includes hundreds of millions of different specimens. Efforts to regulate their trade require international cooperation. This is done by subjecting international trading of select species to certain controls – all imports, exports, re-imports and introductions of any species on the CITES list has to be authorised through a licensing system.

- www.cites.org

[25] Eckersley, Robyn (2004) The Big Chill. The WTO and Multilateral Environmental Agreements, *Global Environmental Politics*, 4(2): 24-50

[26] WTO Legal Texts: The General Agreement on Tariffs and Trade (GATT 1947) Article XX. URL: www.wto.org/english/docs_e/legal_e/gatt47_02\67_e.htm [accessed 21.06.2011]

[27] Carter, Neil (2007) The Politics of the Environment: Ideas, Activism, Policy, (2nd Ed), Cambridge University Press

Box 3: The Opportunity Cost of Debt

Kenya, despite debt reductions, still owes US$7 billion. In its 2005 budget, the country had to allocate as much to debt service repayments as it did to health, water, roads, agriculture, transport and finance combined.

Most of Indonesia's debt was incurred by former dictators and is thus deemed by many to be illegitimate debt. The country's total external debt of $140 billion cost the country $31 billion in debt service repayments in 2004. In 2006, the state budget allocated nearly a quarter of spending on debt service which is nearly four times the amount spent on health and education combined.

- Jubilee Debt Campaign Report (2006)

Challenges and Conflicts

The main challenges and conflicts with trade liberalisation and the state of the current international trading system are agricultural subsidies; the push for developing countries, particularly LDCs, to embrace trade liberalisation perhaps more than is beneficial; the façade of total debt cancellation; and the problems associated with ODA.

Agricultural Subsidies

Despite the WTO bringing with it an overall reduction in tariffs and other protectionist measures, the majority of that effort has, comparatively, come from developing countries. It has been recognised by some that developing countries have offered a significant amount when it comes to trade liberalisation and that it is now time for these efforts to be reciprocated by developed countries[28]. While developed countries have made some effort to recognise the differing needs and capabilities of LDC countries specifically, for example, through the Everything But Arms (EBA) and the African Growth and Opportunities Agreement (AGOA) schemes as mentioned above[29], they are continuing to subsidise a number of agricultural products which LDCs would naturally have a comparative advantage in producing. This has the effect of flooding global markets with products that are priced cheaper than it costs to produce them in the developing countries. This has wide-reaching ramifications for millions of agricultural producers globally - in Africa in particular - who depend on earnings from sugar, cotton, meat, groundnuts, fruits and vegetable exports for their livelihoods[30]. The US, for example, imposes higher taxes on imports from Cambodia and Bangladesh than those from the UK and France, and in doing so receives six times as much money from these tariffs than Cambodia and Bangladesh receive in US aid[31].

In Ghana the chicken market is flooded with cheap produce subsidised by OECD countries that are then sold below the price of local products resulting in the collapse of the local

[28] Third World Resurgence No.249, May 2011, pp.13-17 – The Third World Network magazine. URL: www.twnside.org.sg/title2/resurgence/2011/249/cover03.htm [accessed 21.06.2011]

[29] MDG Gap Task Force Report (2010), Millennium Development Goal 8: The Global Partnership for Development at a Critical Juncture, United Nations, New York http://www.un.org/en/development/desa/news/policy/mdg-gap-2010.shtml

[30] FAO (2003) Trade Reforms and Food Security: Conceptualizing the Linkages; Commodity Policy and Projections Service, Commodities and Trade Division, Rome, p.181 http://www.fao.org/docrep/005/y4671e/y4671e00.htm

[31] Third World Resurgence No.249, May 2011, pp.13-17 – The Third World Network magazine. URL: www.twnside.org.sg/title2/resurgence/2011/249/cover03.htm [accessed 21.06.2011]

industry[32]. Likewise, the C4 - Benin, Burkina Faso, Chad and Mali - rely on cotton production more than any other commodity for their export revenues and can produce it cheaper than anywhere else in the world. This competitive advantage should logically place them in prime position to benefit from the ever increasing demand for cotton products. However, while cotton should be the "white gold" product that lifts tens of millions of West African farmers out of poverty, it is instead being obstructed by a wall of subsidies implemented by the US, EU, China and India to their own farmers. Over the past 9 years, the four trading power blocs have spent US$47 billion on their cotton farmers, dampening down cotton prices for the West African farmers and restricting their ability to trade their way out of poverty. The UK Secretary of State for Trade, Vince Cable, states that the C-4 have lost a total of US$250 million each year as a result of the subsidies put in place by the four richer countries. It is the American growers, who receive over 51% of the subsidies, who benefit the most from "white gold"[33].

The Doha Development Round, initiated in 2001, has so far failed to reach international agreement on how to address subsidies. Reducing subsidies is predicted to be worth within the region of US$100-$200 billion in annual GDP[34]. Yet OECD countries are still to agree to systematically reduce agricultural subsidies. In the absence of such an agreement, some developing countries are resisting opening their markets further and eradicating the import tariffs they currently utilise to protect their economies from the cheap products that result from OECD agricultural subsidies[35].

Challenging the Assumptions of Trade Liberalisation

The efforts established by the EU to provide former colonies with concessionary trading terms were ruled as discriminatory by the WTO in 2002 and the EU has since been striving to replace them with Economic Partnership Agreements (EPAs). EPAs are agreements between the EU and African, Caribbean and Pacific countries (ACP) aimed at promoting trade between the two groups, to integrate ACP into the world economy and to share opportunities offered by globalisation[36]. However, while the original intentions are benign some have criticised EPAs for requiring more trade liberalisation of developing countries' economies than may be beneficial — such as cutting their tariffs to zero for 80% of their imports[37].

It is conventional to argue that openness to trade contributes to economic growth, yet while this theory is supported by a number of empirical studies some commentators have cautioned against mistaking correlation for causation[38]. It has been argued that that the only 'systematic relationship is that countries reduce barriers as they get richer', and that initial economic growth is often generated when trade is protected[39]. While economic growth in developing countries is often attributed to liberalisation, other factors such as population

[32] The Poultry Site (2010) Cheap Imports Damaging Ghana's Poultry Industry, Monday 2nd August 2010. URL: http://www.thepoultrysite.com/poultrynews/20605/cheap-imports-damaging-ghanas-poultry-industry

[33] The Fairtrade Foundation (2010) The Great Cotton Stitch Up, A Fairtrade Foundation Report November 2010. URL: http://www.fairtrade.org.uk/includes/documents/cm_docs/2010/f/2_ft_cotton_policy_report_2010_loresv2.pdf

[34] Lynn, Jonathan (2009) *Doha Deal could boost world GDP $300-700 billion: Study"*, Reuters URL: www.reuters.com/article/2009/08/16/us-trade-doha-forecast-idUSTRE57F0KD20090816 [accessed 23.06.2011]

[35] Third World Resurgence No.249, May 2011, pp.13-17 – The Third World Network magazine. URL: www.twnside.org.sg/title2/resurgence/2011/249/cover03.htm [accessed 21.06.2011]

[36] European Commission http://ec.europa.eu/trade/wider-agenda/development/economic-partnerships/

[37] Third World Resurgence No.249, May 2011, pp.8-9 – The Third World Network magazine. URL: www.twnside.org.sg/title2/resurgence/2011/249/cover02.htm [accessed 21.06.2011]

[38] FAO (2003) Trade Reforms and Food Security: Conceptualizing the Linkages; Commodity Policy and Projections Service, Commodities and Trade Division, Rome http://www.fao.org/docrep/005/y4671e/y4671e00.htm

[39] Rodrik, D. 2001. *The global governance of trade: as if development really mattered*. New York: UNDP.

dynamics, climate patterns, degrees of technical development and domestic policy sets are just as likely to be responsible[40]. Somewhat separately, it has been claimed that even where trade liberalisation does unequivocally lead to economic growth, import growth is likely to exceed export growth, ultimately leading to 'a reduction in domestic productive capacity and in the purchasing power of consumers'[41]. Finally, it is undoubtedly the case that economic growth brought about by liberalisation cannot be expected to be benefit all equally; rather, 'there are likely to be significant differences between the impacts on small scale and commercial farmers, rural non-farm producers and urban consumers both within and across countries'[42]. There is no clear consensus around the relationship between economic growth and openness to trade, and the supposed merits of liberalisation should not be taken for granted.

ODA

ODA in general is trailing behind commitments and is characterised by unmet promises: the G8's Gleneagles commitment is expected to only reach $11 billion of the $25 billion promised, and only 0.31% of donor GNI has been committed against the 0.7% target which is the same as the equivalent figure in 1990[43]. However, problems with ODA go beyond the failure of developed countries to live up to their financial commitments; the aid system itself suffers from a number of deficiencies that limit success even where aid is forthcoming. Firstly, aid can have a negative impact on institutions and accountability in developing countries, undermining the emergence of effective and accountable states. Secondly, it is clear that the proliferation of ever more aid agencies, transaction costs and administration costs reduce the value of aid, leading to large overheads. A further problem is represented by short-termism and unpredictability, which tends to significantly reduce the effectiveness of aid. This latter point connects to the fact that there is too much emphasis upon clearly measurable results at the expense of evaluation, learning and feedback; taking a long-term view might necessitate new, less black and white models of monitoring and evaluation.[44] Insufficient harmonisation across the aid system is a further issue. Vietnam received 752 donor missions in 2008, equalling more than 3 per day and is symbolic of the fact that the average size of projects has been decreasing whilst the number of projects has been going up[45]. Furthermore, the financial crisis has put a dampener on the prospects for achieving more aid in the near future and the 2010 G8 summit in Canada was respectively disappointing[46].

Debt Relief

For some countries, the cancellation of their debt has been deemed to go some way toward making up for the lack of ODA. Thirty two countries have had their debt cancelled by the MDRI which is a great step forward and represents a fundamental shift in official approaches towards debt cancellation[47]. But there are still many countries who have yet to qualify for debt cancellation - only those who are included in the Highly Indebted Poor

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[40] Sachs, J. & Warner, A. 1995. Economic reforms and the process of global integration, *Brookings Papers on Economic Activity*, 1-118.

[41] SAPRIN. 2001. *The policy roots of economic crisis and poverty: a multi-country participatory assessment of structural adjustment - Executive Summary.* Washington DC: Structural Adjustment Participatory Review International Network.

[42] FAO (2003) Trade Reforms and Food Security: Conceptualizing the Linkages; Commodity Policy and Projections Service, Commodities and Trade Division, Rome
http://www.fao.org/docrep/005/y4671e/y4671e00.htm

[43] OneWorld.net Foreign Aid Guide, November 2010, URL: uk.oneworld.net/guides/aid [accessed 22.06.2011]

[44] Barder, Owen (2009) Beyond Planning: Market and Networks for Better Aid, *Centre for Global Development, Working Paper 185*, http://www.cgdev.org/content/publications/detail/1422971/

[45] Barder, Owen (2009) Beyond Planning: Market and Networks for Better Aid, *Centre for Global Development, Working Paper 185*, http://www.cgdev.org/content/publications/detail/1422971/

[46] OneWorld.net Foreign Aid Guide, November 2010, URL: uk.oneworld.net/guides/aid [accessed 22.06.2011]

[47] Jubilee Debt Campaign Report (2006) The Multilateral Debt Relief Fund: The good, the bad and the ugly

Countries (HIPC) scheme are eligible whereas numerous middle income countries who have severe debt burdens do not qualify. Furthermore, the level of debt cancellation is arguably inadequate - on average, the benefit to developing countries is approximately US$1.25 billion a year in debt service reductions whereas the Jubilee Debt Campaign has estimated that "low income countries need debt cancellation that cuts debt service payments by at least $10 billion a year now if they are to have any chance of meeting the interim development goals set out in the MDGs". The current amount is only about 10% of what is needed to cancel all debt. As was highlighted in the report, "the average yearly saving of US$1.25 billion is a significant amount — enough to put 25 million children in school — but is equal only to the amount that the world's poorest countries altogether pay in debt service every 12 days".

Trade-Environment Conflicts

While there are few cases where environmental MEAs and the WTO have conflicted directly after the implementation of the MEAs, there are increasing tensions being noticed before MEAs are adopted. In 2010, for example, efforts at the CITES CoP15 in Qatar to ban trading in polar bear skins and bluefin tuna were both defeated[48]. There are also continuing tensions within the Doha Development Round of discussions about the role the Precautionary Principle will be allowed to play in MEAs as the principle goes against the core rules of the WTO generating more space for disputes in the future[49].

There have also been increased discussions about unilateral import tariffs under the environmental clauses of the WTO — the American Clean Energy and Security Act in 2009, also known as the Waxman-Markey Bill, would have implemented a carbon trading system within the US much like the European Emissions Trading Scheme (EU ETS)[50]. In doing so, the international competitiveness of the domestic market would have been affected and so one of the proposals was to impose 'carbon tariffs' on imports of certain goods from countries not seen to be doing enough to reduce their greenhouse gas emissions. A number of developing countries, especially India and China, disproved of this strongly on the grounds of 'green protectionism'[51].

Corruption

Corruption in some developing countries can be particularly rife which reduces the effects of governance and has been found to be detrimental to making the most of development opportunities. Corruption in developing countries overall is estimated to result in a 20-40% loss of ODA per annum and to cost Africa, for example, more than US$148 billion per year (roughly 25% of GDP)[52]. These figures encourage donors to place conditionalities upon aid in order to prevent a loss in the amount received by the population through development initiatives and to encourage transparency and accountability[53].

[48] CITES Press Release, 18th March 2010 http://www.cites.org/eng/news/press/2010/20100318_tuna.shtml

[49] Brack and Gray (2003) Multilateral Environmental Agreements and the WTO, for the Royal Institute of International Affairs Sustainable Development Programme and the International Institute of Sustainable Development http://www.worldtradelaw.net/articles/graymeawto.pdf

[50] World Resource Institute http://www.wri.org/stories/2009/07/wri-summary-hr-2454-american-clean-energy-and-security-act-waxman-markey

[51] East Asia Forum http://www.eastasiaforum.org/2009/07/02/us-waxman-markey-bill-changes-the-landscape-of-international-climate-change-negotiations/

[52] Transparency International UK, Corruption Data http://www.transparency.org.uk/corruption-data

[53] Daron Acemoglu and Thierry Verdier (2000) The Choice Between Market Failures and Corruption, *The American Economic Review*, (90):1 p.194-211

Way Forward

The strong push in Chapter 2 of Agenda 21 to liberalise trade now needs to be reviewed in light of evidence and experience which suggests that trade liberalisation is not the panacea for all nations involved in the international trading system. Rather, recognition of the heterogeneity of countries will allow for a more hybrid trading system that is just, equitable and efficient. In the case of agricultural subsidies, this means OECD countries being prepared to liberalise more, whilst allowing some protectionist measures to be implemented by LDCs. Developing a fair and coherent international trade regime is ever more important due to the increasing unreliability of ODA and the complex nature of debt cancellation. Trade gives developing countries the opportunity to be involved in the international markets, and when done with their needs in mind, can work to their comparative advantage to build their economies, increase GDP and contribute to their development[54].

In regards to the trade-environment nexus, this is likely to become more complex as the objectives of free trade increasingly clash with imperatives of natural resource conservation and ecosystem preservation. As the need for global environmental stewardship intensifies due to the increasing importance of protecting global public goods such as forests, it may become increasingly untenable for the global trading system to be governed by existing rules and procedures. Increased regulation of the trade in environmental products may be necessary, in addition to the incorporation of ecosystem value into products and services, in order to have potentially significant impacts on 'business as usual' in global trade. As a result, the fractious relationship between trade and the environment could either be ameliorated by an increase in compatibility, or be exacerbated by conflicting priorities.

[54] FAO (2003) Trade Reforms and Food Security: Conceptualizing the Linkages; Commodity Policy and Projections Service, Commodities and Trade Division, Rome, p.166 http://www.fao.org/docrep/005/y4671e/y4671e00.htm

Chapter 3: Combating Poverty

Introduction

Agenda 21 recognised that poverty is 'the shared responsibility of all countries' and it promoted the importance of addressing development, sustainable resource management and poverty eradication simultaneously. While the main indicator of poverty reduction is lowering the number of people living on less than US$1.25 per day, the means to achieving this are multiple and complex. It is not simply about having very low income but about hunger, undernutrition, illiteracy, unsafe drinking water, lack of access to health services, social discrimination, physical insecurity and political exclusion[1].

During the 1990s there was a realisation the poverty alleviation is not just to do with increasing incomes and national GDP, but that development is comprised of a myriad of factors that all play together to reduce poverty and provide sustainable livelihoods. The first official manifestation of this was the Human Development Report in 1990 which recognised that human development is:

> *"about creating an environment in which people can develop their full potential and lead productive, creative lives in accord with their needs and interests. Development is thus about expanding the choices people have to lead lives that they value. And it is thus about much more than economic growth, which is only a means — if a very important one — of enlarging people's choices... Fundamental to enlarging these choices is building human capabilities — the range of things that people can do or be in life"*[2]

As Chapter 3 in Agenda 21[3] outlines, it involves empowering communities through them gaining control of their natural resources and being able to manage their land, through devolving political responsibilities and their voice in the wider policy arena, and establishing methods for enhanced communication between local communities themselves. It also involves management related activities such as investment in infrastructure and human resources, thus creating employment opportunities, establishing the right infrastructure for educational and healthcare services, and providing family planning and the mainstreaming of women's rights. Furthermore, for these to be successful at the national level, international and regional support must be available in terms of technical and knowledge assistance, plus monetary assistance in terms of Overseas Development Assistance (ODA) and debt relief.

This multifaceted approach that considers education, health, women's rights, to name a few, has been fundamental in defining the development debate and paradigm over the last twenty years. It is within these ideas that Agenda 21 was established[4].

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[1] Chronic Poverty Research Centre (2009) The Chronic Poverty Report 2008-209: Escaping poverty traps. URL: http://www.chronicpoverty.org/7BA1DF3A-7BF9-4488-BD4B-BC2B910EC43A/FinalDownload/DownloadId-EE2E05D07AFDC157A9C49442F990779C/7BA1DF3A-7BF9-4488-BD4B-BC2B910EC43A/uploads/publication_files/CPR2_ReportFull.pdf

[2] UNDP The Human Development Concept http://hdr.undp.org/en/humandev/

[3] UNDESA Division of Sustainable Development (1992) Agenda 21 Chapter 3: Combating Poverty. URL: http://www.un.org/esa/dsd/agenda21/res_agenda21_03.shtml

[4] Human Development Report 2010, UNDP, p.2 http://hdr.undp.org/en/media/HDR_2010_EN_Complete_reprint.pdf

Implementation

International Cooperation

At the Millennium Summit in 2000, the largest gathering of international leaders adopted the UN Millennium Declaration committing their nations to a new global partnership to reduce extreme poverty and setting out a series of time bound targets that have become known as the Millennium Development Goals (MDGs). The MDGs are the world's first time bound and quantified targets for addressing extreme poverty in many of its dimensions[5]. Two years after the Millennium Summit, and ten years after the inception of Agenda 21, the World Summit on Sustainable Development was held in Johannesburg where world leaders came together to adopt more concrete steps and identify quantifiable targets for better implementing Agenda 21[6].

Poverty Eradication

Between 1990 and 2005, the number of people living in extreme poverty defined as living on less than US$1.25 per day in developing regions, decreased from 1.8 billion (46%) to 1.4 billion (27%). and is anticipated to fall to 15% by 2015 if the MDG target is to be met[7]. However, US$1.25 per day is the upper limit and in 2005 the average income of people living below the line was actually only US$0.88 per day. The poverty gap, which indicates the success of economic growth and distribution of income and consumption, has decreased since 1990 in all developing regions except West Asia. The depth of the Sub-Saharan Africa poverty gap was initially the greatest but this has fallen since 1999[8]. Importantly, the Human Development Report (2010) states that averages can be misleading in figures like these, and highlights that income inequality since the 1980s has actually risen in some countries more than it has fallen[9]. Furthermore, the number of people experiencing chronic hunger in 2009 surpassed 1 billion for the first time in history[10]. One billion people also lack clean drinking water, 1.6 billion lack electricity and 3 billion lack adequate sanitation[11].

Financial Crisis

Prior to the financial crisis, there was confidence that all developing regions except Sub-Saharan Africa, West Asia and parts of Eastern Europe and Central Asia, would achieve the target in MDG 1 of "halving the number of people living extreme poverty between 1990 and 2005"[12]. However, due to the financial crisis it is estimated that, compared to pre-crisis projections, an extra 50 million people were living in extreme poverty by the end of 2009 rising to 64 million by the end of 2010. These consequences are also deemed to be incredibly "chronic" in that the affects of the financial crisis are likely to be felt throughout the coming decade, and that as a result, poverty will be higher in 2015/2020 than it would have been otherwise[13]. The progress being made on

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[5] UN Millennium Project (2006) http://www.unmillenniumproject.org/goals/index.htm

[6] UN Johannesburg Summit (2006) http://www.johannesburgsummit.org/html/basic_info/basicinfo.html

[7] Millennium Development Goal Report 2010, UNDP http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf

[8] Millennium Development Goal Report 2010, UNDP http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf

[9] Human Development Report 2010, UNDP, p.6 http://hdr.undp.org/en/media/HDR_2010_EN_Complete_reprint.pdf

[10] IFAD Annual Report 2010, p.10 http://www.ifad.org/pub/ar/2010/e/full.pdf

[11] World Development Report 2010, World Bank, p.xx http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/EXTWDRS/EXTWDR2010/0,,menuPK:5287748~pagePK:64167702~piPK:64167676~theSitePK:5287741,00.html

[12] Millennium Development Goal Report 2010, UNDP http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf

[13] Millennium Development Goal Report 2010, UNDP, p.2

reducing the number of people living with chronic hunger has also been slowed as a result of the financial crisis. In total, between 1991 and 2007, the figure has dropped by only 1 percentage point from 17% to 16% and in real figures the number of people living in hunger has increased from 817 million in 1992 to 830 million in 2007[14] (Figure 3).

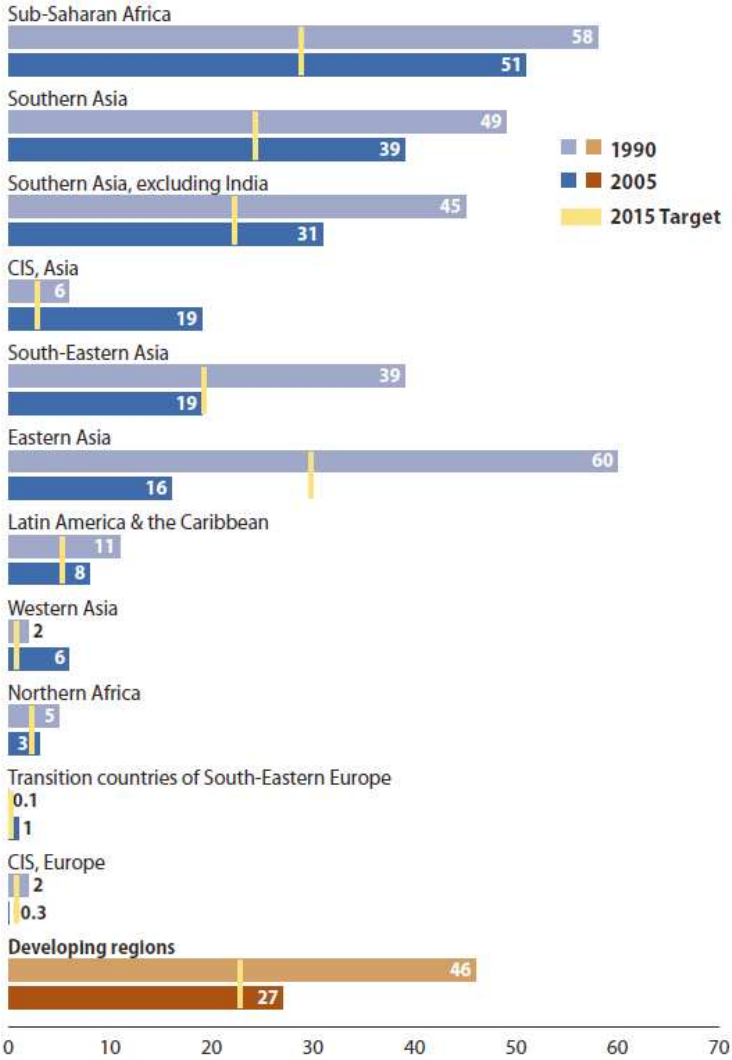

Figure 1. Proportion of people living on less than US$1.25 per day, 1990 and 2005 (%)
Source: Millennium Development Goals Report 2010

http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf
[14] Millennium Development Report 2010, UNDP, p.9/10
http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf

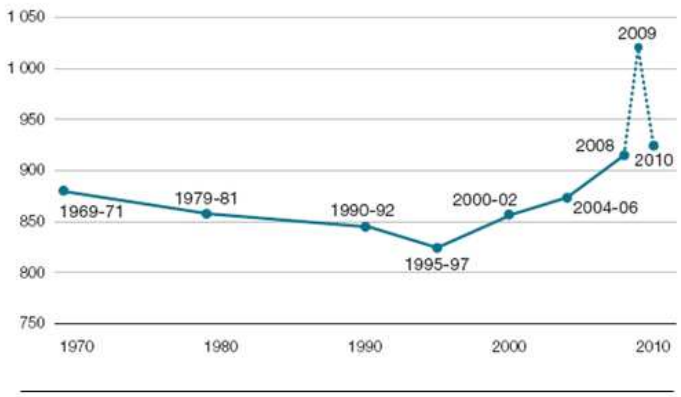

Figure 2. Number of undernourished people in the world (millions of people)
Source: FAO, "State of food security in the world" and FAO, "Global hunger declining, but still unacceptably high". Taken from Rural Poverty Report, 2011.

Empowerment

Evidence for the empowerment of local communities is substantial and varied. As 75% of the world's poorest people live in rural areas and rely on agriculture and natural resources for their livelihoods[15], the increased number of community based initiatives and discourses — such as Community Based Natural Resource Management (CBNRM), Community Based Conservation (CBC) and Community Based Adaptation (CBA) — is indicative that the focus of development policy has indeed shifted. Now there is heightened recognition that communities have the expertise on how to manage natural resources more sustainably. Central to this shift is the debate on land tenure and resource ownership[16]. Various and numerous policies and guidelines have been created and political attention to this issue has also increased, for example through the 16th and 17th Sessions of the UN Commission on Sustainable Development in 2008 and 2009 respectively, in both of which land tenure issues featured prominently[17]. Emphasis on the rights and needs of local communities and indigenous people on the whole is also growing — there are an increasing number of UN Agencies, UN Declarations, international policy forums and regional groups which focus on the role of indigenous people and local communities in poverty eradication. In Africa, for example, there are numerous initiatives spanning all levels (Box 1).

[15] IFAD Rural Development Report, 2011
http://www.ifad.org/rpr2011/report/e/rpr2011.pdf
[16] IFAD Annual Report 2009, p.14
http://www.ifad.org/pub/ar/2009/e/print.pdf
[17] IFAD Annual Report 2009, p.14
http://www.ifad.org/pub/ar/2009/e/print.pdf

Box 1: Processes and Institutions focussing on Community Empowerment

International examples

- UN Specialised Agency International Fund for Agricultural Development (IFAD) , 1977
- UN Commission on Sustainable Development (UNCSD)
- UN Declaration on the Rights of Indigenous People (UNDRIP), 2007
- UN Poverty and Environment Initiative (UNPEI), 2005
- Poverty and Environment Partnership (PEP), 2002

Africa examples

Continental

- African Union (AU), 2001
- New Partnership for Africa's Development (NEPAD), 2001

Regional

- Southern African Development Community (SADC), 1992
- Comité Permanent Inter-Etats du Lutte Contre La Sécheresse dan la Sahel (CILSS), 1973

Community

- Sahel 21 Initiative, 1995

Employment

Beyond empowering local communities and establishing national frameworks for doing so, Chapter 3 of Agenda 21 outlines the need for countries to invest in infrastructure and human resources including employment opportunities for women and access to education and healthcare including maternal health.

The Millennium Development Report 2010 found that the employment-to-population ratio for all developing countries only decreased from 63 to 62 between 1998 and 2008. The number of people in vulnerable employment decreased more significantly between the same time period from 65% to 59%. However, between 2008 and 2009 an additional 3.6% of the world's workers were at risk of falling into poverty[18] and the post-2008 figures are even worse. The employment-to-population ratio stagnated and remained at 62% in 2009; the number of people in more vulnerable forms of employment has risen from 2008 figures to 60%, reversing the downward trend occurring before the financial crisis; and labour productivity in 2009 decreased further than employment with a negative growth in output per worker except in North Africa and East and South Asia. The proportion of employed people living below the poverty line of US$1.25 per day has also increased since the crisis from 26% in 2008 to 31% in 2009, after a downward trend from 46% in 1998[19]. The International Labour Organisation (ILO) has estimated the global vulnerable employment rate in 2009 to have been between 49-53% equalling 1.5-1.6 billion in the developing world[20].

Women

Women's empowerment has been progressing slowly. The number of women in paid employment outside of the agricultural sector has increased slowly to 41% globally in 2008, but these are typically less well paid and less secure. Furthermore, in countries where the agricultural sector plays a significant role, women tend to be employed in subsistence farming, unpaid family work

[18] Millennium Development Report 2010, UNDP, p.8 http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf

[19] Millennium Development Report 2010, UNDP, p.9/10 http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf

[20] International Labour Office (Jan 2010) Global Employment Trends. URL: www.ilo.org/public/libdoc/ilo/P/09332/09332(2010-January).pdf [accessed 22.06.2011]

or own account work[21] which are all more vulnerable with little/no financial security or social benefits. Women are also still overrepresented in informal employment[22], and the financial crisis has led to a surge in the numbers finding themselves in the informal sector. On the other hand, women have been rising in political power but this has tended to be when quotas or special measures have to be filled[23].

Education

Net enrolment in primary education increased by 7% between 1999 and 2008 from 82% to 89% for developing countries as a whole but this is still not sufficient to meet the MDG 2 target of universal basic education by 2015. In Sub-Saharan Africa and South Asia progress has been the lowest, yet in the former the figure has still increased from 58% in 1999 to 76% in 2008. National policies here have played a significant role. For example, Burundi abolished all fees for attending primary school and witnessed a threefold increase since 1999 to almost 99% in 2008. Furthermore, the number of children out of school has decreased from 106 million in 1999 to 69 million in 2008, and the gender gap has also closed in the out-of-school population. The share of girls in this group of out-of-school population decreased from 57 per cent to 53 per cent globally between 1999 and 2008[24].

Children, Infants and Maternal Health

Child deaths have been falling, though not as fast as anticipated. The mortality rate of children under 5 per 1000 live deaths dropped from 100 in 1990 to 72 in 2008. This is due to recent successes such as controlling measles, but the benefits may be short lived if the prevalent funding gaps in this area are not fulfilled. Maternal mortality has been a serious issue in the past and - whilst progress is being made the rate of reduction is still not at the 5.5% annual decline needed to meet the MDG target of a three quarter reduction by 2015. Only one in three women receive the recommended care during pregnancy and the progress made in contraceptive use has slowed — between 1990 and 2000 there was a jump from 52% to 60% in the number of women in marriage or in union using any method of contraception between the age of 15 to 49, but this has since stagnated growing only 2 percentage points between 2000 and 2007. A reduction in funding towards family planning (8.2% of ODA in 2000 to 3.2% in 2008) is hindering women's ability to make their own choices and choose alternatives[25]. Globally, an estimated 215 million women would delay or avoid pregnancy but do not have access to family planning[26].

National Plans

Adopting national plans is fundamental to ensuring all the above elements are dealt with. As Chapter 3 of Agenda 21 states:

> *"poverty is a complex multidimensional problem with origins in both national and international domains. No uniform solution can be found for global application. Rather,*

[21] Own-account workers are those workers who, working on their own account or with one or more partners, hold the type of job defined as a self-employed job, and have not engaged on a continuous basis any employees to work for them during the reference period. http://stats.oecd.org/glossary/detail.asp?ID=1986

[22] The informal sector consists of small-scale, self-employed activities (with or without hired workers), typically at a low level of organization and technology, with the primary objective of generating employment and incomes. The activities are usually conducted without proper recognition from the authorities, and escape the attention of the administrative machinery responsible for enforcing laws and regulations. http://www.ilo.org/public/english/region/asro/bangkok/feature/inf_sect.htm

[23] Millennium Development Report 2010, UNDP, p.37 http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf

[24] Millennium Development Report 2010, UNDP, p.17 http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf

[25] Millennium Development Report 2010, UNDP, p.36 http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf

[26] www.everymothercounts.org

country-specific programmes to tackle poverty and international efforts supporting national efforts, as well as the parallel process of creating a supportive international environment, are crucial for a solution to this problem"[27]

There have been various efforts at instigating national level development plans. In 1999, the IMF and the World Bank established the process of Poverty Reduction Strategy Papers (PRSPs) to improve planning, implementation and monitoring of public actions aimed at reducing poverty, and as a pre-requisite for debt relief within the Highly Indebted Poor Countries (HIPC) scheme[28]. Countries were encouraged to adopt national development strategies such as a PRSP at the 2005 World Summit as part of the Paris Declaration. The Paris Declaration on aid effectiveness was adopted in 2005 and contains five core principles based on previous experience of what works and what does not work in development and that enable aid recipients to forge their own National Development Plans. The five principles are ownership, alignment, harmonisation, results and mutual accountability. The Accra Agenda for Action (AAA) in 2008 aimed to strengthen and deepen the impact of the Paris Declaration and set an agenda for stronger ownership, inclusive partnership and delivering of results, and capacity building[29]. The MDGs were also adopted soon after the PRSPs as tools for development policy on a broader scale and so for many countries PRSPs and MDGs are aligned and mutually supportive[30]. By combining PRSPs, NSSD and the longer term plans for the MDGs, the UNDP is confident that PRSPs can become more strongly rooted in domestic ownership of both content and process[31].

ODA

Internationally, overall aid flows were reported to have been at an all time high of US$120 billion in 2009 but in reality this actually translated into an increase of less than 1% in real terms and is a shortfall of over US$20 million annually to the Gleneagles G8 agreement made in 2005. The share of Overseas Development Assistance (ODA) currently pledged is only 0.31% of donor GNI, well below the UN target of 0.7%. With the financial crisis, this is unlikely to change. International cooperation in terms of debt reductions and cancellations has also made some progress in the last two decades with the World Bank and IMF cancelling part of 32 countries' debts alongside reductions and cancellations by bilateral donors. However, there are still many countries missing from this initiative and some challenges with the debt cancellation process.

Challenges and Conflicts

Global Financial Crisis and ODA

The financial crisis has been, and will continue to be, a major challenge in combating poverty not only because of the statistics outlined above and the stalling of most poverty indicators, but also because of the risk of reduced international commitments to support developing countries. Many developing countries rely on the injection of ODA to conduct their investments in infrastructure

[27] Chapter 3: Combating Poverty. Agenda 21, Section I (1992) URL: www.un.org/esa/dsd/agenda21/re_agenda21_03.htm

[28] The Economic Commission for Africa (2006) National Strategies for Poverty Reduction and Implementation of the Millennium Development Goals: An Issues Paper for the African Plenary on National Strategies for Poverty Reduction and Implementation of the Millennium Development Goals, March 26-28, 2006, Cairo, Egypt http://www.uneca.org/prsp/cairo/documents/issues%20paper_final.pdf

[29] OECD Development Cooperation Directorate http://www.oecd.org/document/18/0,3343,en_2649_3236398_35401554_1_1_1_1,00.html

[30] The Economic Commission for Africa (2006) National Strategies for Poverty Reduction and Implementation of the Millennium Development Goals: An Issues Paper for the African Plenary on National Strategies for Poverty Reduction and Implementation of the Millennium Development Goals, March 26-28, 2006, Cairo, Egypt http://www.uneca.org/prsp/cairo/documents/issues%20paper_final.pdf

[31] Greeley, Martin (2008) Synthsis Report: Findings and Recommendations from a Seven Country Study of UN Engagement in Poverty Reduction and National Development Strategies, prepared for The United Nations Development Group, New York, March 2008. URL: www.undg.org/docs/8969/IDS-PRSP-study-final.pdf [accessed 25.06.2011]

and human development. The delivery of official ODA fell well short of the Gleneagles target set for 2010, and there are little signs of the situation improving. In the UNDESA Report on Delivering on International Commitments (2010) it was felt that "the perceived need among many donor countries to start fiscal consolidation sooner rather than later could put resource availability under further pressure precisely at a juncture where aid commitments beyond 2010 have yet to be firmed up"[32].

As a result of the increasing uncertainty relating to ODA there has been a resurgence in focus on the importance of economic growth and wealth creation. In a recent report Oxfam has found that:

> *"now in the wakes of the global economic crisis, the donors' emphasis is once again on 'growth' (as it was in the 80s), but this time on sustainable, inclusive growth... some possible explanations for the resurgence of interest in economic growth among donors are aid fatigue and their own domestic fiscal difficulties, both of which mean that they are looking to self-sustaining economic growth as a possible alternative to development finance[33]"*

Redistribution

Development policies, while focusing on pro-poor growth, have often neglected a focus on redistribution and inequality. Oxfam has found that "there is still the unwillingness to talk about redistribution as a necessary component of a policy mix" - DFID doesn't mention equality or sustainability in its one-page vision statement on sustainable growth (2010)[34]; the Canadian International Development Agency (CIDA) has a new strategy on sustainable economic growth (2010)[35] — and though it does mention equality gender, employment, skilled workforce and agriculture but fails to mention redistribution as way to deal with this. This reveals the degree to which international development policies are at least partly defined by the overarching political objectives of particular governments. In recognition of the need to establish global norms in relation to redistribution and inequality, the 2010 Human Development Report has released three new indicators which deal specifically with inequality (Box 2)[36].

Box 2

Three new Human Development Indicators that account for inequality in health, education and income:

- Inequality Adjusted Development Index
- Gender Inequality Index
- Multidimensional Poverty Index

For example, these indicators have found that Sub-Saharan Africa suffers the largest HDI losses because of substantial inequality across all three dimensions. Whereas other regions have one dimension to blame more than others i.e. health in Asia causes statistically more inequality than education and income.

\- Human Development Report 2010

[32] MDG Gap Task Force Report (2010) Millennium Development Goal 8: The Global Partnership for Development at a Critical Juncture, United Nations, New York
http://www.un.org/en/development/desa/news/policy/mdg-gap-2010.shtml

[33] Stuart, Elizabeth (2011) Making Growth Inclusive: Some lessons from countries and the literature, Oxfam Research Reports,p.6. URL: www.oxfam.org/sites/www.oxfam.org/files/rr-inclusive-growth-260411.pdf [accessed 20.06.2011]

[34] DFID Business Plan 2011-2015 URL: http://www.dfid.gov.uk/About-DFID/Finance-and-performance/DFID-Business-plan-2011---2015/

[35] 'Stimulating Sustainable Economic Growth: CIDA's sustainable economic growth strategy', Canadian International Development Agency, November 2010.
http://www.acdicida.gc.ca/INET/IMAGES.NSF/vLUImages/EconomicGrowth/$file/Sustainable-Economic-Growthe.pdf

[36] Human Development Report 2010, UNDP
http://hdr.undp.org/en/media/HDR_2010_EN_Complete_reprint.pdf

Empowerment

Direct efforts to empower local communities have perhaps not been as extensive as is necessary. For example, community-based approaches to natural resource management have symbolised the start of a necessary change in thinking towards devolution and participation. Community-based approaches such as Community Based Natural Resource Management (CBNRM), Community-Based Conservation (CBC) and Community-Based Adaptation (CBA) are all attempts to devolve management of the local natural resources to the local communities in a way that means they will gain economic benefits from their use or preservation. The Zimbabwe CAMPFIRE scheme (Communal Areas Management Programme for Indigenous Resources) has been a leading example and a role model for the initiatives implemented in its surrounding southern African neighbours. However, various studies have found that the reality rarely reflects the rhetoric of devolution and participation[37] and those devolution policies have often had disappointing impacts on local livelihoods[38]. In many CAMPFIRE projects, for example, it was found that a disproportionate amount of income was retained by the state at district level or captured by elites[39]. Instigating community based schemes for natural resource management has perhaps been seen as too simplistic in the past whereas in reality there are numerous factors to be considered for it to be successful — the hierarchical structure of the devolution process, the capacity of local communities to take control of the natural resources, the local economy, cultural practices that may affect the success of the project. Even when true devolution has occurred, problems can still arise from the lack of community capacity to take on a management role successfully[40].

More recently, the debate about participation and devolution to local communities and indigenous peoples has been reignited with Reduced Emissions from Deforestation and Degradation (REDD). This initiative has been under discussion at the UNFCCC Conference of the Parties since 2005 and due to increased criticism about the lack of consideration of local people within the suggested scheme, has recently evolved into REDD+ with additional provisions towards the roles and rights of local people. Despite the REDD initiative originating from indigenous populations in countries suffering from climate change and consequent international policy, the Rainforest Coalition[41] has had to continue fighting to keep the recognition of local communities' roles in these REDD projects, and the benefits they should accrue, at the forefront of discussions[42]. For markets like those proposed under REDD+ to be successful, there "needs to be a more level playing field; a recognition that markets are intensely politicised and easily captured by elites"[43].

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[37] Sheona Shackleton, Bruce Campbell, Eva Wollenberg & David Edmunds (2002) Devolution and community-based natural resource management: Creating space for local people to participate and benefit?, ODI Natural Resource Perspectives No. 76, URL: http://www.odi.org.uk/resources/download/2068.pdf

[38] Blaikie, Piers (2007) Community-based Natural Resource Management Questioning the success stories', DFID id21 Natural Resources Highlights 4 Conservation March 2007 http://www.dfid.gov.uk/r4d/PDF/Outputs/IDS/id21-Conservation_4.pdf

[39] Sheona Shackleton, Bruce Campbell, Eva Wollenberg & David Edmunds (2002) Devolution and community-based natural resource management: Creating space for local people to participate and benefit?, ODI Natural Resource Perspectives No. 76, URL: http://www.odi.org.uk/resources/download/2068.pdf

[40] Kenneth K. Odero and Prisca Huchu (1998) Community-Based Ecotourims Venture: The Case of Sunungukai Camp, Zimbabwe; The World Bank/WBI's CBNRM Initiative; URL: http://srdis.ciesin.org/cases/zimbabwe-004.html

[41] The Rainforest Coalition is led by the Governments of Papua New Guinea and Costa Rica, and supported by numerous other forested nations. It is responsible for starting the idea of REDD and has continued to put the pressure on the international community to ensure it is established in a fair and equitable way.

[42] O'Connor, David (2008) "Governing the global commons: Linking carbon sequestration and biodiversity conservation in tropical forests", *Global Environmental Change* 18: 368-744

[43] Ashely, Caroline and Wolmer, William (2003) "Transforming of Tinkering? New Forms of Engagement Between Communities and the Private Sector in Tourism and Forestry in Southern Africa", Research Paper 18 for the Sustainable Livelihoods in Southern Africa Programme 2003. URL: http://www.odi.org.uk/resources/download/993.pdf accessed 25.03.2011

Globalisation

Empowerment of local communities of the type purported in Agenda 21 only goes so far towards aiding poverty alleviation. In a globalised world, there are many issues and factors that affect poverty in a global scope and in which those affected have no way of influencing. For example, the international trade system and the push for trade liberalisation has an impact on the national economy and on the potential for small scale farmers to make a better living but is in the hands of the national governments and to some degree, the governments of other countries due to tariffs and subsidies (see Chapter 2). In addition, food prices have been increasing due to a myriad of reasons including severe drought, crop failure and perhaps exaggerated by the financial crisis and rise in food prices. (see Chapter 2).

Way Forward

Inequality in poverty and in development initiatives so far is still endemic and is one of the major issues to deal with in the future. Oxfam has found that there are "some policy areas which have been shown in the past to translate economic growth into inclusive growth"[44]. These include 1) a redistributive agenda that includes health, education, and agricultural services and a progressive taxation system; 2) macroeconomic prudence meaning sustainable, moderate levels of inflation, deficits, and debt whilst ensuring the protection of the pro-poor elements of public spending; and 3) a policy environment conducive to pro-poor private investment, and in particular the domestically owned, labour-intensive private sector, especially SMEs[45]. The new HDI measures of inequality for health, income and education could help in highlighting areas of inequality not previously noticed or conspicuous, and bring to light both intra- and inter-country disparities[46].

Both the empowerment of local communities and preservation of natural resources are beginning to be tied to the international markets with the commodification of environmental services and products such as REDD+ and Payment for Ecosystem Services (PES). However, the debate here has only just begun and there are many contentions surrounding land tenure and land rights, Free Prior and Informed Consent (FPIC) and the role local communities will actually play in these new methods of natural resource management. Ensuring that devolution and participation is enacted in a way that benefits the local communities, increases their capacity to manage and allows them to fulfil the role of stewards is incredibly important[47].

[44] Stuart, Elizabeth (2011) Making Growth Inclusive: Some lessons from countries and the literature, Oxfam Research Reports, p32. URL: www.oxfam.org/sites/www.oxfam.org/files/rr-inclusive-growth-260411.pdf [accessed 20.06.2011]

[45] Stuart, Elizabeth (2011) Making Growth Inclusive: Some lessons from countries and the literature, Oxfam Research Reports, p.32. URL: www.oxfam.org/sites/www.oxfam.org/files/rr-inclusive-growth-260411.pdf [accessed 20.06.2011]

[46] Human Development Report 2010, UNDP http://hdr.undp.org/en/media/HDR_2010_EN_Complete_reprint.pdf

[47] Blaikie, Piers (2007) Community-based Natural Resource Management Questioning the success stories', DFID id21 Natural Resources Highlights 4 Conservation March 2007 http://www.dfid.gov.uk/r4d/PDF/Outputs/IDS/id21-Conservation_4.pdf

Chapter 4: Changing Consumption Patterns

Introduction

Chapter 4 of Agenda 21 — 'Changing Consumption Patterns' — recognises that unsustainable patterns of production and consumption are key factors contributing to global environmental degradation. Furthermore, the Chapter states that "although consumption patterns are very high in certain parts of the world, the basic consumer needs of a large section of humanity are not being met". In practice this results "in excessive demands and unsustainable lifestyles among the richer segments, which place immense stress on the environment", with "the poorer segments...unable to meet food, health care, shelter and education needs."[1] Chapter 4 asserts the need for efficient production systems and changes in consumption patterns in order to achieve high environmental quality and sustainable development — for example through optimising natural resource use and reducing waste.[2]

Chapter 4 concentrates on **two main programme areas** — (a) focussing on unsustainable patterns of production and consumption and (b) developing national policies and strategies to encourage changes in unsustainable consumption patterns. As the issue of changing consumption and production patterns is extensive and systemic, it is important to recognise and consider linkages to other sustainable development issues — particularly energy, transportation and waste - and the relevant chapters within Agenda 21, notably, chapters 5, 7, 9, 20, 21, 22 and 34.

Implementation

Growth in Consumption

Growth since 1992 has occurred at a steady rate in developed and industrialised countries and has grown swiftly in developing nations. Whilst part of this increase can be attributed to an increasing global population, much of the rise is as a result of advancing levels of prosperity across a number of nations.[3] Rapid levels of economic growth have further stimulated the demand for resources, such as food, fuel, electronic goods, land and increasing areas of space for the disposal of wastes. Such demand requires resources to be sourced from outside national borders creating increasing levels of environmental degradation and further widening the gaps between industrialised and developing nations — for example, both the Living Planet Indices[4] for tropical and globally poorer nations have plummeted by 60 percent since 1970.[5]

Growth in Resource Use

Although resource use has significantly reduced per unit of global economic output over the last 25 years[6] (by around 30 per cent), globally we are using around 50 per cent more natural resources than we were. In 2009 it was estimated that global consumption of raw materials was around 60 billion tonnes a year and projections suggest on current trends this could be 100 billion tonnes by 2030. Though that consumption is not equitably distributed, North American per capita

[1] 4.5, Chapter 4, Agenda 21 http://www.un.org/esa/dsd/agenda21/res_agenda21_04.shtml
[2] 4.15, Chapter 4, Agenda 21 http://www.un.org/esa/dsd/agenda21/res_agenda21_04.shtml
[3] Gardner, G., Assadourian, E., and Sari, R. (2004) The State of Consumption Today, Chapter 1 in, The State of the World Today; URL: http://www-rohan.sdsu.edu/faculty/dunnweb/StateofWorld2004.dat.pdf p4
[4] The Living Planet Index (LPI) is an indicator of the state of global biological diversity, based on trends of vertebrate populations of 2,500 species from around the world
[5] WWF, Living Planet Report (2010) p5 http://assets.panda.org/downloads/lpr2010.pdf
[6] Jackson, T. (2009) Prosperity without growth: economics for a finite planet. 1st edition. Earthscan. London

consumption is around 90 kg of resources per day, around 45 kg per day for Europeans and around 10 kg per day for people in Africa[7].
In some OECD countries, there has been a decline in resource use, emissions and waste whilst incomes have risen[8]. In order for this to occur, and to meet the objectives of the Chapter, there is the need for an unwavering level of effort by all stakeholders. The amount of primary energy consumed to produce each unit of global economic output has fallen almost continuously since 1950. The global energy intensity is now a third lower that it was in 1970[9] and these gains have been most pronounced in OECD countries. Synonymous with reducing energy intensities is a reduction in carbon intensity per global economic unit. China reduced its energy intensity by around 70 per cent between 1980 and 2000, but worryingly has now started to rise again. This demonstrates evidence of 'relative decoupling', but not 'absolute decoupling'. As although energy and carbon intensities are reducing, global emissions have increased by almost 80 per cent since 1970[10].

Growth in Waste

Global economies can be seen as ecosystems in themselves and like ecosystems; they import energy and resources and transform them into products. The difference being that natural ecosystems are cyclical processes and our economies operate largely by linear transformation. The result is that resources and materials are consumed as if there are no limits and the products have little to no value once produced and sold (see box 1). We are however now reaching the outer limits of the economic ecosystem where resource limits are apparent and recovering materials from waste is increasingly economical. To achieve more sustainable consumption, the lifecycle of products must be assessed in terms of a 'cradle-to-cradle' mindset rather than the current 'cradle-to-grave' approach (more detail in Chapter 20).

Box 1

"The scale of the problem (*waste*) is extraordinary. More than 90 per cent of all materials extracted to manufacture ordinary consumer products ends up as waste; only 10 per cent — and sometimes less — ends up in the product itself. And given the success that some manufacturers have had in ensuring their products don't last very long... the lifetime of many of those products is very short before they are rejected and replaced, meaning that only around 1 per cent of all materials flowing through the US economy ends up still being used six months after manufacture."

Porritt, J (2007)

In 2006, global municipal waste production was estimated at 1636 million tonnes per year[11]. There is global consensus that waste avoidance and recycling far outweigh the benefits from any waste treatment technology, even when energy is recovered during the process. And although waste avoidance is often considered the primary objective of waste management, it receives the least resources and effort[12]. Building on the tenets of COP 7, the Basel Convention (COP10) in 2004 called for the building of global waste partnerships to address waste issues, particularly

[7] FOE (2009) Overcomsumption? Our use of the world's natural resources. Accessed at: www.foe.co.uk/resource/reports/overconsumption.pdf
[8] DESA (2010) Trends in sustainable development: towards sustainable consumption and production, p31 http://www.un.org/esa/dsd/resources/res_pdfs/publications/trends/trends_sustainable_consumption_production/Trends_in_sustainable_consumption_and_production.pdf
[9] IPCC (2007) Climate change 2007: Mitigation. Contribution of working group III to the fourth assessment of the IPCC. Cambridge. Cambridge University Press.
[10] Jackson, T. (2009) Prosperity without growth: economics for a finite planet. 1st edition. Earthscan. London
[11] OECD (2008) Environmental Outlook to 2030.Organisation for Economic Cooperation and Development.Accessed at: http://www.oecd.org/dataoecd/16/35/47058547.pdf
[12] UNEP (2010) Waste and Climate Change: Global Trends and Strategy Framework. Accesses at: http://www.unep.or.jp/ietc/Publications/spc/Waste&ClimateChange/Waste&ClimateChange.pdf

hazardous wastes. It recognised that far from reducing, recycling and reusing (the 3Rs) we are globally seeing unprecedented growth in the generation of general and hazardous wastes. Progress has been made, particularly in the more developed industrialised countries, at reducing waste to landfill, incentivising more recycling, introducing waste treatment technologies such as emission-controlled incineration, composting and anaerobic digestion; however the disparity between levels of waste management in developed and developing countries is wide and growing.

Lack of Decoupling

The aim is to redesign production processes, goods and services so that economic output is progressively less dependent on material throughput so that global economies can continue to grow without breaching ecological limits or extinguish resources[13]. It is clear that there have been efficiency gains in resource use; globally we are doing more with less. However population growth and an exponential expansion of the consumer class is driving consumption considerably faster than efficiency measures can reduce resource depletion. There are clear examples of 'relative decoupling', globally we have reduced energy intensities for each unit of economic output by around 33 per cent since 1970. Global emissions have reduced relative to GDP by around 25 per cent, but emissions are still rising. To address sustainability, efficiency measures must increase at least as fast as economic output. Recent data suggests that as emerging economies build up their infrastructure, the demand for structural materials escalates and global resource intensities, rather than declining, are actually increasing.

Rise in overall environmental impact of humans on planetary systems

The Ecological Footprint[14] indicates the number of global hectares (gha) of biologically productive land and water required in order to generate the concentration of renewable resources consumed for global human use and for the absorption of carbon dioxide waste generated (the bio-capacity).[15] The most recent estimates of global and national Ecological Footprints were generated in 2007 and dramatically surpass the Earth's bio-capacity by over 50 per cent[16] - humanity's Ecological Footprint in 2007 was 18 billion gha (2.7 gha per person), whilst the bio-capacity of the Earth was just 11.9 billion gha (1.8 gha per person).[17] This equates to the Earth taking one and half years to restore the concentration of renewable resources consumed in one year (2007) and to absorb the carbon dioxide waste produced in the same year.[18] The Ecological Footprint of the global population has increased by over a third since the production of Agenda 21.[19]

While the global Ecological Footprint exceeds the world's bio-capacity, the per capita Ecological Footprints of individual countries are extremely varied, with drastic differences between nations with differing economic and development levels (see figure 1). A large proportion of the population in developing nations have an Ecological Footprint that is often below the average bio-capacity of the globe. For example, the average Mozambican claims just 0.47gha of bio-capacity.[20] On the other hand, the majority of individuals within developed and industrialised

[13] Jackson, T. (2009) Prosperity without growth: Economics for a finite planet. Earthscan. London. ISBN: 978-1-84407-894-3
[14] The area of productive land an economy necessitates in order to produce the level of resources and removal of wastes (for example CO2) required. WWF, Living Planet Report (2010) p7 http://assets.panda.org/downloads/lpr2010.pdf
[15]The area of productive land available to produce such resources and waste removal.WWF, Living Planet Report (2010) p7 http://assets.panda.org/downloads/lpr2010.pdf
[16] WWF, Living Planet Report (2010) p7 http://assets.panda.org/downloads/lpr2010.pdf
[17] GFN, 2010a in WWF, Living Planet Report (2010) p7 http://assets.panda.org/downloads/lpr2010.pdf
[18] WWF, Living Planet Report (2010) p18 http://assets.panda.org/downloads/lpr2010.pdf
[19] WWF, Living Planet Report (2010) p7 http://assets.panda.org/downloads/lpr2010.pdf
[20] Gardner, G., Assadourian, E., and Sari, R. (2004) The State of Consumption Today, Chapter 1 in, The State of the World Today http://www-rohan.sdsu.edu/faculty/dunnweb/StateofWorld2004.dat.pdf, p16

nations, particularly in North America and Western Europe, have per capita Ecological Footprints that drastically surpass this figure. The average American uses 9.7 gha of bio-capacity.[21]

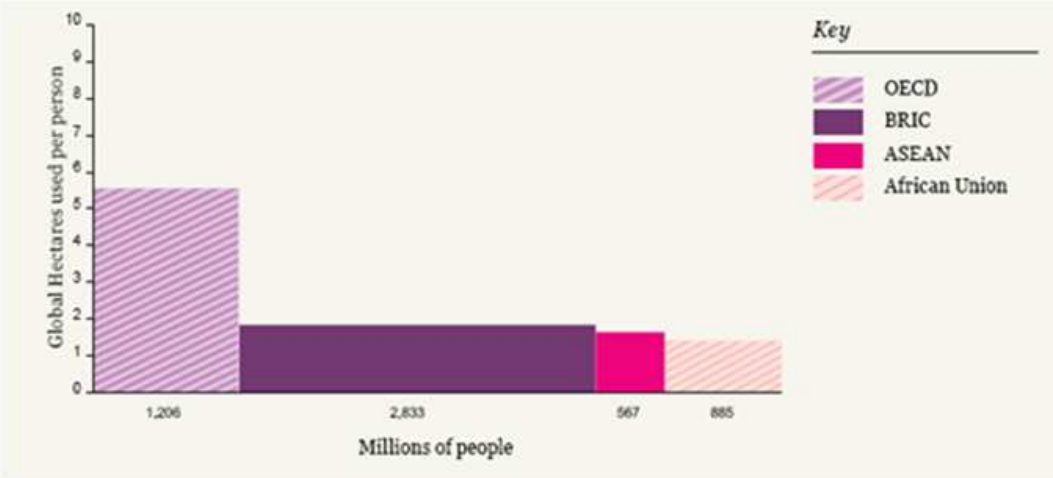

Figure 1. The ecological footprint by political grouping as a function of per capita footprint and population, 2007
Source: WWF Living Planet Report, 2010:40.

Figure 2 shows that the 31 Organisation for Economic Co-operation and Development (OECD) countries — comprised of the richest national economies — are responsible for 37 per cent of the global Ecological Footprint. While the 53 African Union countries and the 10 Association of Southeast Asian Nations (ASEAN) countries — comprised of some of the poorest and least developed — together account for just 12 per cent of the global Ecological Footprint[22]. Overall the total Ecological Footprint for all four political groups - OECD, ASEAN, BRIC (Brazil, Russia, India and China), and the African Union - has increased since the introduction of Agenda 21, in particular the carbon footprints. The pace of such growth has varied dramatically between groups and highlights the drastic increase in consumption levels of China and India over a relatively short period of time.[23]

As the most recent estimates for humanity's Ecological Footprint were generated several years ago, it is very likely that such estimates will be greater now, particularly when considering the impacts of the growth of consumers in China and India — this is discussed in more detail later in the analysis.

[21] Gardner, G., Assadourian, E., and Sari, R. (2004) The State of Consumption Today, Chapter 1 in, The State of the World Today http://www-rohan.sdsu.edu/faculty/dunnweb/StateofWorld2004.dat.pdf, p16
[22] WWF, Living Planet Report (2010) p20 http://assets.panda.org/downloads/lpr2010.pdf
[23] WWF, Living Planet Report (2010) p20 http://assets.panda.org/downloads/lpr2010.pdf

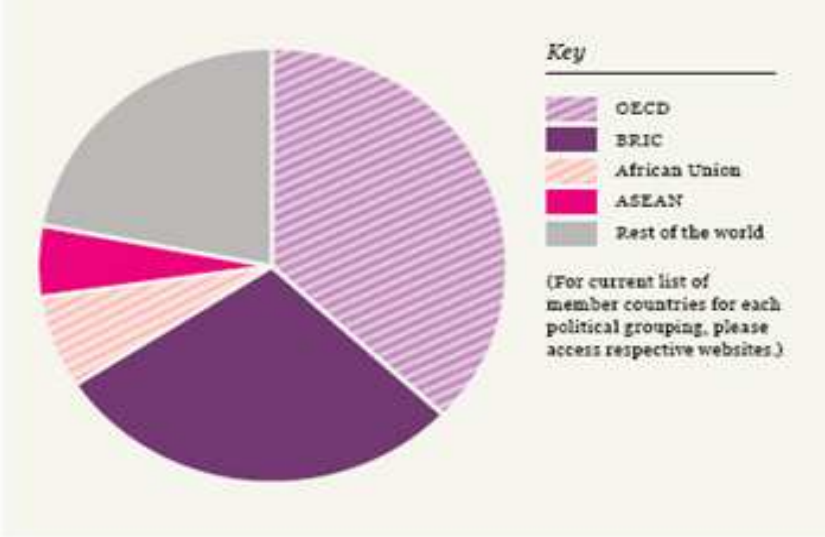

Figure 2. The ecological footprint for OECD, ASEAN, BRIC and African Union countries in 2007, as a proportion of humanity's total ecological footprint
Source: The Global Footprint Network, 2010, in The Living Planet Rerport, 2010:39.

Growing Affluence — "Rise of the Consumer"
It is estimated that there are now over 1.7 billion members of the 'consumer class'[24] almost half of which are found within developing countries — predominantly China and India — who, when combined, account for approximately 20 per cent (362 million people) of the global total.[25] In comparison, the smallest consumer class is found within sub-Saharan Africa, with just 34 million people (see Table 1). Whilst China and India have a larger consumer class in comparison to Western Europe it must be remembered that on average, the individual level of consumption in China and India remains considerably below the average individual level within Western Europe. Furthermore, there has been a more than 20 per cent decline of private consumption expenditure per individual — the consumption of goods and services at the household level — between 1991 and 2001 in sub-Saharan Africa. This highlights increasing disparities between the developed, industrialised nations and regional sub-Saharan Africa[26].

Currently Europe's consumer class comprises 89 per cent of the total population, while in developing regions there is high potential for a dramatic increase in the size of their consumer class. Currently a minority of the population in developing regions are considered members of such a set; just 16 per cent of the total population for China and India. Therefore, with the prospective increases in human population in developing countries, a significant rise in the consumer class looks likely. Estimates based on population projections suggest that by 2015 the global consumer class will comprise of at least 2 billion people compared to 1.7 billion in 2002.[27]

[24] Defined by the former UNEP consultant Matthew Bentley as individuals with incomes over $7,000 of purchasing power parity, with members usually being users of the internet, telephones, televisions. Bentley, M. (2003) Sustainable consumption: ethics, national indices and international relations. In Gardner, G., Assadourian, E., and Sari, R. (2004) The State of Consumption Today, Chapter 1 in, The State of the World Today http://www-rohan.sdsu.edu/faculty/dunnweb/StateofWorld2004.dat.pdf, p6
[25] Gardner, G., Assadourian, E., and Sari, R. (2004) The State of Consumption Today, Chapter 1 in, The State of the World Today http://www-rohan.sdsu.edu/faculty/dunnweb/StateofWorld2004.dat.pdf, p6
[26] Gardner, G., Assadourian, E., and Sari, R. (2004) The State of Consumption Today, Chapter 1 in, The State of the World Today http://www-rohan.sdsu.edu/faculty/dunnweb/StateofWorld2004.dat.pdf, p6
[27] Gardner, G., Assadourian, E., and Sari, R. (2004) The State of Consumption Today, Chapter 1 in, The State of the World Today http://www-rohan.sdsu.edu/faculty/dunnweb/StateofWorld2004.dat.pdf, p7

Table 1. Consumer Class 2002, by region

Region	Number of People Belonging to the Consumer Class	Consumer Class as Share of Regional Population	Consumer Class as Share of Global Consumer Class[1]
	(million)	(percent)	(percent)
United States and Canada	271.4	85	16
Western Europe	348.9	89	20
East Asia and Pacific	494.0	27	29
Latin America and the Caribbean	167.8	32	10
Eastern Europe and Central Asia	173.2	36	10
South Asia	140.7	10	8
Australia and New Zealand	19.8	84	1
Middle East and North Africa	78.0	25	4
Sub-Saharan Africa	34.2	5	2
Industrial Countries	912	80	53
Developing Countries	816	17	47
World	1,728	28	100

[1] Does not add to 100 due to rounding.
Source: Gardner, G; Assadourian, E.; and Sari, R., The State of Consumption Today, Chapter 1 in The State of the World Today, 2004:7.

Globalisation in Production

The global trade in final goods has risen significantly since 1980, multi-national companies have drastically changed their production strategies to minimise their production costs[28]. Part of what globalization entails is greater international trade in final goods as opposed to importing component parts and then final assembly near the regional market. In the current environment, companies are more able to fragment their operations internationally, locating each stage of production in the country where it can be done at the least cost, and transmitting ideas for new products and new ways of making products around the globe. While a globalisation of production is a positive 'force' for the consumer and producer, inequalities amass in local labour markets no longer able to compete with lower labour wages elsewhere and the lack of global accountability in labour rights, human rights, environmental regulation and corruption abuses can result in increasing environmental degradation and poverty simply to provide ever cheaper products. For example, globalisation has caused significant discrepancies in many areas, particularly labour markets, where dominant consumer markets can force conditions to suit their markets, often to the detriment of others:

> "China has emerged as a major producer of cheap, primarily "low-end" consumer goods, exported mainly to the North American market. Its trade surplus with the United States skyrocketed from a little more than $10 billion in 1990 to $103 billion in 2002. Even Mexico, long a centre of low-cost factories, finds itself increasingly unable to compete because Chinese wages on average are just a quarter of those prevalent in Mexico. Just since 2001, one seventh of Mexico's *maquiladora* export plants have shut down."[29]

[28] Brooks (2005) Producing security: Multinational Corporations, Globalization, and the changing calculus of conflict. Princeton University Press
[29] Renner, M. (2004) http://www-rohan.sdsu.edu/faculty/dunnweb/StateofWorld2004.dat.pdf p97

Instruments for Promoting Sustainable Production and Consumption

Purchasing and Pricing

Governments — particularly in developed countries where the public sector plays a large role in the economy - can hold large sway on corporate decisions and public perceptions. Government purchasing choices can influence whole markets, such as that of food, transportation and electronic equipment. Whilst trends indicate that resource use per capita is rising with rising levels of affluence, it has been observed that this rate of increase slows to some extent as nations become more developed and their markets for material-concentrated goods becomes more saturated. Since the adoption of Agenda 21, there appears to be an increase in the number of governments, local authorities, organisation, businesses and civil society groups addressing issues of unsustainable production and consumption, attempting to discover successful methods to decouple resource use, waste and damaging emissions from economic activity. Such actions relate directly to addressing objectives under programme area (b) of Chapter 4[30], for example the objective of exercising leadership through government purchasing[31].

Standards and labels

As consumers have become more informed about the effect that their consumption is having on the planet, demand has been driven from the bottom up as well as from the top down to provide more information to the consumer class about where and how products are produced. This has resulted in a plethora of environmental labelling, or eco-labelling, sustainability ratings, standards and subsidies, to name a few[32]. These consumer education instruments have had limited impact on consumer trends in isolation, but when a component of a barrage of national or regional measures they can be an effective tool.

Regulation

National or regional regulation can be effective instruments for instigating paradigm shifts or incentivising innovation. The EU Directive for Waste Electrical and Electronic Equipment (WEEE, 2002/96/EC) is a good example that shifts the responsibility for end-of-life management of certain product categories from the tax payer and municipalities to producers and consumers — both these examples are called *extended producer responsibility* and follow the *polluter pays principle.* When first introduced this Directive was relatively ineffective at instigating innovative eco-design of electrical products as the costs were simply passed on to the consumer, however the charges for end-of-life disposal have been increased and more innovation has been observed reducing the usage of hazardous materials in production.

Analytical tools

Life Cycle Assessment (LCA) is an example of a tool used by businesses to improve their environmental performance, allowing for the evaluation of "all stages of a product's life from the perspective that they are interdependent, meaning that one operation leads to the next".[33] LCA "provides a comprehensive view of the environmental aspects of the product or process and a more accurate picture of the true environmental trade-offs in product and process selection".[34] In 2002, UNEP established the Life Cycle Initiative, which aims to facilitate the uptake of LCA with

[30] 4.15-4.27, Chapter 4, Agenda 21 http://www.un.org/esa/dsd/agenda21/res_agenda21_04.shtml
[31] 4.23, Chapter 4, Agenda 21 http://www.un.org/esa/dsd/agenda21/res_agenda21_04.shtml
[32] DESA (2010) Trends in sustainable development: towards sustainable consumption and production, p13 http://www.un.org/esa/dsd/resources/res_pdfs/publications/trends/trends_sustainable_consumption_production/Trends_in_sustainable_consumption_and_production.pdf
[33] U.S. Environmental Protection Agency (2006), 'Life Cycle Assessment: Principles and Practice', p. 1 http://www.epa.gov/nrmrl/lcaccess/pdfs/chapter1_frontmatter_lca101.pdf
[34] Ibid.

the aim of achieving sustainable development[35]. In 2006, the UNEP Annual Report evaluated progress made thus far and described that 22 of the 28 lifecycle proposals from developing countries (5 from Africa, 5 from Asia, 11 from Latin America and 1 from Eastern Europe) where chosen to receive the Life Cycle Assessment Award — "the award honours outstanding contributions of individuals and organisations in promoting life cycle thinking and in improving life cycle assessment approaches"[36]. Similarly, in 2005 the European Commission launched a platform aiming to facilitate greater communication of life-cycle data and improve coordination between existing initiatives, with a view to eventually creating a handbook of LCA best practice.[37]

There have also been efforts made by non-governmental organisations. In 1998, the World Wildlife Fund (WWF) released the first Living Planet Report which consisted of numerous indicators (Living Planet Index) on the state of the global environment and biodiversity. In 2010, the 8th edition of this report was released continuing the publication of the declining pattern shown throughout the last 12 years of the state of the living planet[38]. The Index has shown a 35 per cent decline in the planet's ecological health since 1970 and plays a fundamental role in the UN Convention of Biological Diversity's (UNCBD) analysis[39]. As part of this, in 2003, the Global Footprint Network was formerly established as an international think tank that attempts to advance sustainability by measuring "how much nature we have, how much we use and who uses what"[40].

Resource Efficiency

By improving resource efficiency by reducing environmental the total environmental impact of the production and consumption of goods and services from raw material extraction to final use and disposal, consumption needs are more likely to be met while still respecting the carrying capacity of nature and the environment[41]. Since 1992 there have been various global initiatives launched that have aimed to highlight this need for production and consumption efficiency and to put forward frameworks in which to carry out actions and programmes.

Sustainable consumption and production — Multilateral Initiatives

A decade after the Rio conference and the creation of Agenda 21, the World Summit on Sustainable Development (WSSD) in Johannesburg agreed to promote the development of a "10-Year Framework of Programmes on Sustainable Consumption and Production (SCP)".[42] In order to support the elaboration of the 10 year framework, the so-called "Marrakech Process" was put in place in 2003 as a collaborative effort between UN Environment Programme (UNEP), UN Department of Economic and Social Affairs (UN DESA) — who act as the lead agencies — national governments, development agencies and civil society. The three self-defined goals of the process were to: assist countries in their efforts to green their economies; to

35 UNEP (2006) United Nations Environment Programme Annual Report 2006, URL: http://books.google.co.uk/books?id=3vTSVD-3434C&pg=PA41&lpg=PA41&dq=Nairobi+lifecycle+initiative&source=bl&ots=Mg_nBiMtNO&sig=38y7llpPojSHrp6koOpPQTOR0nQ&hl=en&ei=N2iRTqCzAYOi8QPT9ME9&sa=X&oi=book_result&ct=result&resnum=5&ved=0CEYQ6AEwBA#v=onepage&q&f=false

36 UNEP (2006) United Nations Environment Programme Annual Report 2006, URL: http://books.google.co.uk/books?id=3vTSVD-3434C&pg=PA41&lpg=PA41&dq=Nairobi+lifecycle+initiative&source=bl&ots=Mg_nBiMtNO&sig=38y7llpPojSHrp6koOpPQTOR0nQ&hl=en&ei=N2iRTqCzAYOi8QPT9ME9&sa=X&oi=book_result&ct=result&resnum=5&ved=0CEYQ6AEwBA#v=onepage&q&f=false

37 http://ec.europa.eu/environment/ipp/lca.htm

38 WWF (2010) Living Planet Report.URL: http://wwf.panda.org/about_our_earth/all_publications/living_planet_report/

39 Gardner, G., Assadourian, E., and Sari, R. (2004) The State of Consumption Today, Chapter 1 in, The State of the World Today http://www-rohan.sdsu.edu/faculty/dunnweb/StateofWorld2004.dat.pdf,

40 Global Footprint Network (2009) Do we fit on our planet? URL: http://www.footprintnetwork.org/en/index.php/GFN/

41 UNEP (2009) Resource Efficiency.URL: http://www.unep.org/pdf/brochures/ResourceEfficiency.pdf

42 World Business Council for Sustainable Development (WBCSD) (November 2008) Sustainable Consumption, Facts and Trends: From a Business Perspective. URL: http://www.wbcsd.org/DocRoot/I9Xwhv7X5V8cDIHbHC3G/WBCSD_Sustainable_Consumption_web.pdf

help corporations develop greener business models; and to encourage consumers to adopt more sustainable lifestyles[43]. However it is difficult to find any significant successes of this process or any tangible outcomes to date.

In Europe, the European Union established a Sustainable Development Strategy in 2006 which involved the development of an action plan for sustainable production and consumption. It reaffirmed the necessity of global cooperation and integration[44]. In July 2009, the European Commission established a review of the Strategy and found that the EU has managed to mainstream the concept of sustainable consumption and production into a large number of policies, but that there are still areas where practice needs to be improved and increased[45].

Technological Innovations/Technology Transfer/Leapfrogging

A key objective of Chapter 4 is the promotion of production systems that reduce environmental stress.[46] The most significant technological advancement since 1992 has been the accelerated progression and increasing dissemination of Information and Communication Technologies (ICT) across developing and developed nations. Although the production of ICT systems and equipment requires significant material flows and the use of such systems produces considerable energy demands, ICT has led to major developments in energy and resource efficiency and declines in waste levels.[47] For example, estimates suggest that the carbon mitigation reductions made available by ICT operations offset the ICT sector's new carbon footprint by a factor of five.[48]

The application of technological innovations, such as industrial biotechnology and energy-saving nanotechnologies, are often advertised as another tool for improving productivity levels and reducing levels of environmental stress; even though the latter may not be the primary objective.[49] This is particularly so when considering the increasing demands placed on natural resources as a result of increasing population and increasing levels of affluence. However, such technological innovations are still yet to reach millions of individuals within developing countries, and whilst they have aided in improving production efficiency, their ecological footprints are uncertain and they have not reduced unsustainable patterns of consumption, nor have they led to meeting the basic needs of humanity — an objective outlined in Chapter 4.[50] In addition, technological advancements that have aided in increasing productivity efficiency have also played a lead role in reinforcing unsustainable contemporary consumer values.

Challenges and Conflicts

Developed countries account for around 20 per cent of the global population, but are responsible for around 80 per cent of the lifecycle impacts of consumption[51]. The challenge for these economies is to reduce their ecological footprint and eliminate overshoot. A key challenge in

[43]UNDESA (2008) The Marrakech Process.URL: http://esa.un.org/marrakechprocess/about.shtml
[44] European Commission: Environment (2010) Sustainable Development URL: http://ec.europa.eu/environment/eussd/
[45] European Commission: Environment (2010) Sustainable Development URL: http://ec.europa.eu/environment/eussd/
[46] 4.7, Chapter 4, Agenda 21 http://www.un.org/esa/dsd/agenda21/res_agenda21_04.shtml
[47] DESA (2010) Trends in sustainable development: towards sustainable consumption and production, p29 http://www.un.org/esa/dsd/resources/res_pdfs/publications/trends/trends_sustainable_consumption_production/Trends_in_sustainable_consumption_and_production.pdf
[48]The Climate Group (2008) SMART 2020: Enabling the low carbon economy in the information age, p15 http://www.smart2020.org/_assets/files/Smart2020UnitedStatesReportAddendum.pdf
[49] DESA (2010) Trends in sustainable development: towards sustainable consumption and production, p31 http://www.un.org/esa/dsd/resources/res_pdfs/publications/trends/trends_sustainable_consumption_production/Trends_in_sustainable_consumption_and_production.pdf
[50] 4.7, Chapter 4, Agenda 21 http://www.un.org/esa/dsd/agenda21/res_agenda21_04.shtml
[51]Tukker et al. (2008) Fostering Change to Sustainable Consumption and Production: an evidence based view. Jounal of Cleaner Production 16.1218-1225

developed economies is overcoming 'lock-in' of incumbent processes and infrastructure that reinforce unsustainable practices. Developing countries, on the other hand, are potentially in a more opportunistic position to make sustainable choice as 80 per cent or more of their infrastructure is likely to be constructed during the next few decades. The challenge will be to ensure that they 'leapfrog' the unsustainable practices in mature economies and develop novel sustainable infrastructures, policies and practices of production and consumption. To address sustainable consumption it is important to find solutions to the key barriers:

- The underlying growth engine in our economies and the potential for decoupling;
- How and if global markets contribute to fairness and equality;
- How consumption supportive to sustainability can be discerned from consumption that is destructive for institutions and non-market goods providing quality of life services; and
- How to coordinate efforts to harmonise social aspirations with Government and business models.

Globalisation

Globalisation has meant that addressing global and ingrained phenomena such as consumption, especially when intrinsically wedded to our economic horizons, is particularly complex and daunting. Production, markets and consumption all form part of an interdependent and co-evolving set of services, technologies, consumers, rules, interests and financial mechanisms[52]. It is difficult to change one part without the rest and it is unlikely that one actor within the system alone can or will make the structural and fundamental changes necessary to achieving sustainable consumption.

A globalizing world has also allowed large corporations to look across national borders for cheaper labour—and to pay workers as little as pennies per hour. Export processing zones (EPZs), are minimally regulated manufacturing areas that produce goods for global commerce and have multiplied in the past three decades in response to the demand for inexpensive labour and a desire to boost exports. From 79 EPZs in 25 countries in 1975, the number expanded to some 3,000 in 116 nations by 2002, with the zones employing some 43 million workers who assemble clothing, sneakers, toys, and other goods for far less than it would cost in industrial nations. The zones boost the availability of inexpensive goods for global consumers, but are often criticized for fostering abuses of labour and human rights[53]. As mentioned above, the CSR initiatives such as the GRI are not always highlighting poor practices and have no power to incentivise widespread change.

Growing Affluence

Recent decades have seen affluence levels increase particularly in Western Europe and other industrialised nations, completely outstripping population growth and technological efficiencies. The result is that far from reducing unsustainable consumption patterns, industrialised and developed nations are going the other way. The arithmetic of growth suggests that only with a stable affluence level and population, but increasing technological efficiency can we achieve decoupling. Discussions about population control are difficult politically as are measures to limit or smoothing affluence in order to reduce human impact on global resources. Advances in technology are often relied on as the panacea to today's resource issues, however, new technologies can only go some of the way to relieving demands on resources, a step change in patterns of consumption is still required. We are continuing to see that efficiencies and technological advances are not keeping pace with population and affluence increases.

[52]Tukker et al. (2008) Fostering Change to Sustainable Consumption and Production: an evidence based view. Jounal of Cleaner Production 16.1218-1225

[53] From p12, the state of the world today 2004, chapter 1, the state of consumption today by Gardner, G., Assadourian, E., and Sari, R:

Subsidies Promoting Unsustainable Patterns of Consumption
In 1999, UNDESA published voluntary guidelines to aid national policy-makers to promote sustainable development. One of the key tenets of these guidelines was to identify and remove subsidies that promote unsustainable consumption, particularly in agriculture, construction, utilities, energy sectors and transportation.[54] Implementation globally has been limited; however certain initiatives such as recycling have been successful with around 82 per cent of countries having implemented some form of recycling services by 2004.[55]

Way Forward

Short-term focus for changing consumption patterns should be on consumers within developed countries (see Figure 3). Both intrinsic and extrinsic influences on consumers to change consumption patterns must be developed to effect real change across the business and industry sectors due to the power of the consumer in effecting change in production and consumption patterns. Intrinsic influences must bring about fundamental changes in knowledge of, and attitude toward, achieving sustainable consumption. Eco-friendly lifestyles need to move more into the mainstream and away from the radical in order to drive sustainable consumption. Extrinsic influences must be driven by regional and more importantly national governments to implement new, and strengthen existing, policies to encourage more sustainable consumption.

Millennium Consumption Goals
The Millennium Consumption Goals Initiative (MCGI) was proposed in 2011 to mirror and respond to the Millennium Development Goals (MDGs), but for the industrialised countries. Progress has been made in many of the MDGs, some areas more successful than others in combating poverty, particularly in the provision of safe drinking-water. The MCGI seeks to aim targets at the most consumptive sectors globally who represent around 20 per cent of humanity and yet consume more than 80 per cent of global resources. They seek to achieve sustainable levels of consumption, encourage endemic behavioural change and eliminate wasteful practices while building resilience against resource extinction, pollution, poverty and climate change.

Supporting Sustainable Consumption and Production
In parallel with the rise of more responsible consumer demand, came the process of Corporate Social Responsibility (CSR). It aims to create a balance between the interests of business and those of wider society[56].

In order to enable industry to adhere to acceptable standards the ISO 14000 environmental management standard was devised in 1996 and is now standard practice for third party auditing of corporations. In 2010, 223,149 organisations from over 150 countries were using ISO 14001[57].

The Global Reporting Initiative (GRI) was implemented following the World Summit in Johannesburg in 2002 and is also a powerful supporting tool for sustainable development. In 2010, more than 1,800 organisations from 60 countries were using GRI guidelines to report on

[54]Tarlock, D. (2011) *Do Water Law and Policy Promote Sustainable Water Use?*Rediscovering Sustainable Development Law. 28. 642-669
[55]UNEP (2004) *Tracking progress: implementing sustainable consumption policies, a global review of the United Nations Guidelines for Consumer Protection*, United Nations,New York. Accessed at: http://www.uneptie.org/pc/sustain/reports/library/Tracking_Progress_report_2004.pdf>.
[56] Times Higher Education online (10th July 2002) "Research on corporate social responsibility can boost progress towards Lisbon goals, says Bisquin", URL: http://www.timeshighereducation.co.uk/story.asp?storyCode=170322&sectioncode=26
[57]Interntional Organisation for Standardisation (2009) ISO survey of certifications.Accessed at: http://www.iso.org/iso/pressrelease.htm?refid=Ref1363

their economic, social and environmental performance[58]. Criticism of the GRI is levelled at the lack of incentive for organisations to actually improve performance and that guidelines are too easily manipulated to suit 'business as usual'[59]. Another supporting initiative is called The Carbon Disclosure Project. This project has engaged business and shareholders to encourage more transparency in disclosing the production of greenhouse gas emissions.

The United Nations Global Compact (UNGC), launched in 2000, was an initiative to encourage business to adopt sustainable and socially responsible policies and practices. The UNGC brings together UN agencies, business, civil society and major groups under a global framework to abide by ten guiding principles in the areas of human rights, labour, the environment and anti-corruption. In 2001, the Melbourne Model was initiated to encourage cities to engage with the Compact to deal specifically with urban issues. Critics have voiced concerns over the UNGC; their contention is that the Compact enables companies to use public relations (referred to as 'blue-washing') advantages to being members, yet there is little or no accountability or monitoring of progress towards implementing the principles but is simply used as a marketing tool.[60]

Given the failure over the last two decades to make progress on more sustainable consumption patterns, stronger governance mechanisms are clearly vital. A new agreement for an updated Sustainable Consumption Production Framework would be an important step forward. This would act a complimentary compliance tool for achieving the sustainable consumption goals.

Incentives for more Sustainable Consumption and Production (SCP)

To make serious inroads into SCP there needs to be a paradigm shift in thinking on a global scale towards our approaches to production and consumption. Consumers must be encouraged to make sustainable choices, while governments must recognise that business and producers seek to create the demand which fuels consumption in order to satisfy their own economic interests. Environmental and social externalities must be internalised in order to fully reflect the full and fair costs of products and services. At present the phenomena of 'lock-in' with incumbent unsustainable consumption is prevalent and requires global leadership to make the necessary changes.

[58]Global Reporting Initiative (2010) GRI Sustainability Reporting Statistics.Accessed at: http://www.globalreporting.org/NR/rdonlyres/EDEB16A0-34EC-422F-8C17-57BA6E635812/0/GRIReportingStats.pdf

[59]Moneva, J; Archel, J (2006)."GRI and the camouflaging of corporate unsustainability".*Accounting Forum***30**: 121–137

[60] http://www.unjiu.org/data/reports/2010/JIU.REP.2010.9_For%20Printing_17%20January%202011.pdf, p.14

Chapter 5: Demographic Dynamics and Sustainability

Introduction

Chapter 5 of Agenda 21 reflected a growing awareness that a synergistic relationship exists between demographic trends and sustainable development. It was recognized that population growth can have adverse impacts on environmental sustainability and that – conversely – environmental change and degradation negatively impact human populations, especially those who depend upon natural resources for their livelihoods.

Agenda 21 committed countries to incorporate demographic trends into research and analysis of environment and development issues – including through assessing population 'carrying capacity'[1] of nation states, and improving data collection and analysis on local, national and regional demographic trends. There was also commitment to integrate population and demographic concerns into national planning, developing policy goals and programmes in consultation with relevant stakeholders, placing a specific focus on urban population growth. Integral to considerations of demographic dynamics was a focus on women's rights and empowerment, as well as reproductive health. Though much emphasis was placed on action at a national level, further exploration of the issue was planned for the 1994 International Conference on Population and Development (ICPD), and the United Nations Population Fund (UNFPA) was mandated to enhance interagency coordination and ensure adequate funding for growing needs.

The focus on population in the global policy discourse on environment and sustainable development has declined since 1992 as spiraling consumption rates in developed countries pose as much – if not more – of a challenge to sustainable development as an increasing population does. As population growth is predominantly taking place in developing countries where per capita consumption is still proportionately low, focus has shifted to sustainable consumption and production as a major priority for reducing natural resource exploitation globally (see Chapter 4 analysis for further details). Despite this shift in focus, a consideration of demographic dynamics remains a priority for policy-makers due to its relevance beyond analyses of the interaction between population and environment - especially in the context urban population management, family planning and the importance of reproductive health. In this regard, the Millennium Development Goals represent an important milestone in addressing demographic issues.

Implementation

Global Population Trends

The primary international mechanism for undertaking comprehensive analysis and evaluation of global demographic trends is the UN Population Division of the Department of Economic and Social Affairs (DESA). The agency calculates current rates and projections on specific factors such as total population, fertility, mortality and migration and the relationships between these demographic dynamics to directly inform other UN bodies and a wide range of decision makers at all levels. Recent projections are that global population will reach around 10.1 billion by the

[1]When discussing human populations, the carrying capacity often refers to the number of number of individuals that the Earth (or a region) could hold at different standards of living and levels of resource consumption. Thus, Earth's carrying capacity is smaller if everyone is to achieve the average standard of living of people in the United States than if everyone is to achieve the average standard of living of people in developing countries.

end of the century, rising to 9.3 billion by 2050, with much of the increase coming from high-fertility countries - including 39 countries in Africa, nine in Asia, six in Oceania and four in Latin America.[2] Projections suggest that in these countries population could more than triple between 2010 and 2100, passing from 1.2 billion to 4.2 billion and continuing to increase beyond the turn of the century. By contrast, low fertility countries – including many in Europe, China, Brazil and Russia among others – are likely to peak in population at a level of 3.1 billion by 2030.[3]

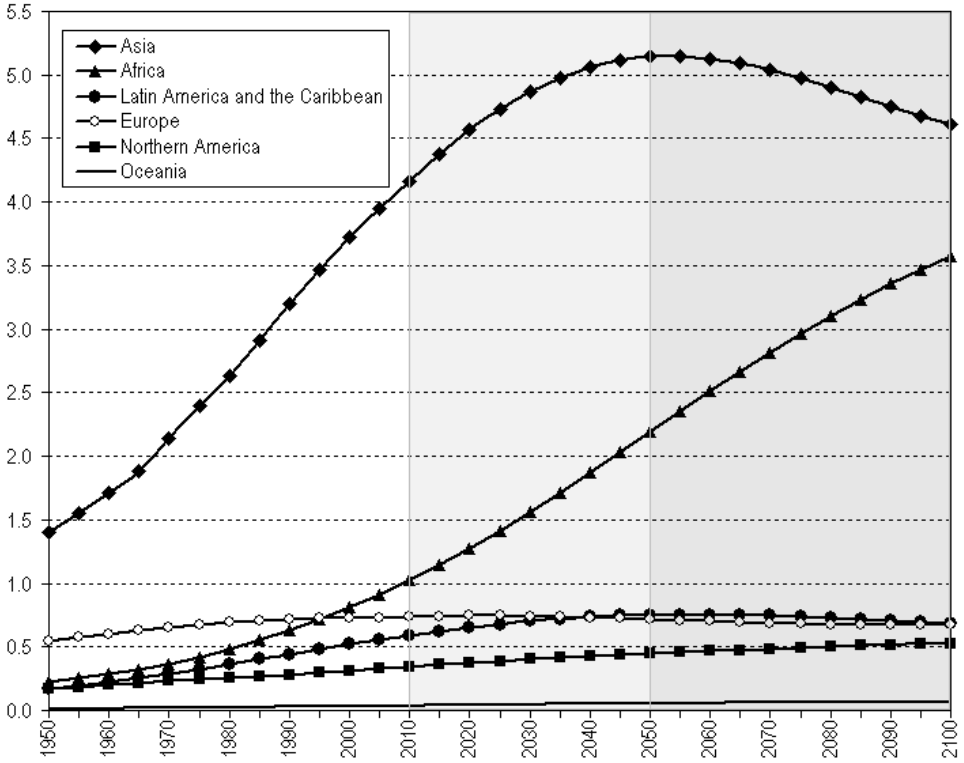

Figure 1. Global population projections
Source: United Nations, Department of Economic and Social Affairs, Population Division (2011)

Such population analyses show unequivocally that the vast majority of population growth will take place in developing countries. 'Out of every 100 persons added to the population in the coming decade, 97 will live in developing countries'.[4]

[2] http://esa.un.org/unpd/wpp/Analytical-Figures/htm/fig_1.htm
[3] http://esa.un.org/unpd/wpp/Analytical-Figures/htm/fig_3.htm
[4] Hania Zlotnik, 2005

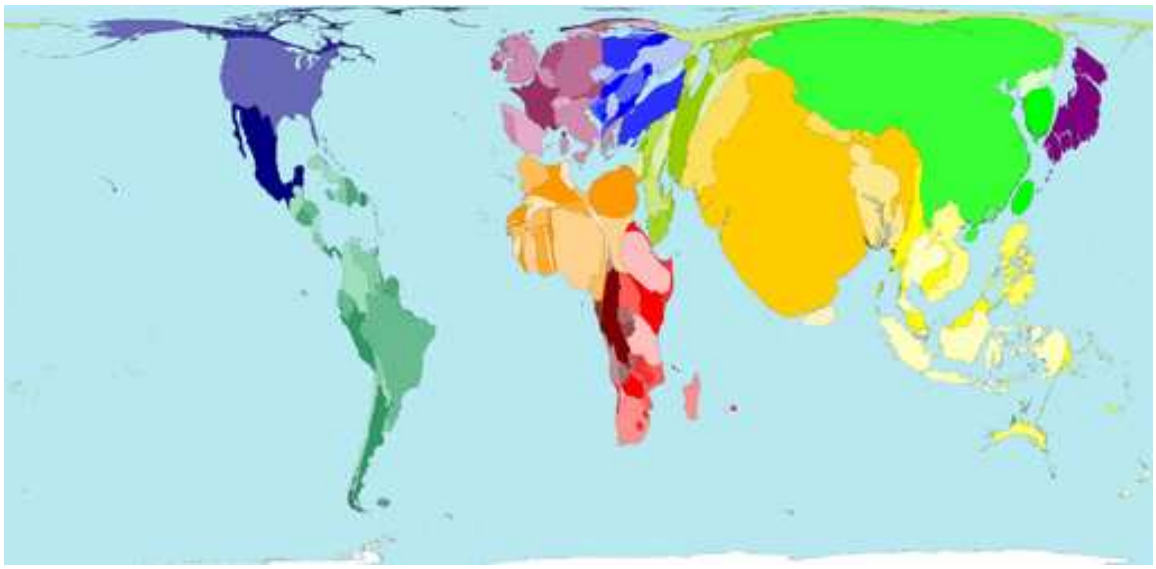

Figure 1. World Map with the size of each territory showing the relative proportion of the world's population living there
Source: www.worldmapper.org

Global fertility rates are significantly lower than during the 20th Century; 1990-95 saw around 4.95 children per woman compared to 2005-10 where that figure was only 3.04.[5] Over the same period, fertility rates in developed regions have remained constant at 1.66, while developing regions have seen a fall from 3.39 to 2.68. In the least developed countries, again over the same period, the fertility rate has fallen from 5.74 to 4.41. The fertility rate remains highest in Sub-Saharan Africa, where it averaged 5.10 from 2005-10, compared with 6.05 from 1990-95.[6]

Since 1990, the use of contraception has increased across all regions, although the Caucasus and Central Asia and East Asia saw a slight fall in contraception use from 2000 to 2008, and since 2000 progress generally has slowed.[7] In developed regions, 72% of women aged 15-49, married or in a union were using contraception in 2008, compared with 69% in 1990; developing regions saw a proportionally higher rise, from 52 to 61%.[8] The greatest single advance was recorded in North Africa, where in 2008 61% women aged 15-49, married or in a union were using contraception, compared with 44% in 1990.[9] In Sub-Saharan Africa the prevalence of contraception remains low, at only 22%, which marks an improvement of only 2% since 2000. As the number of women of reproductive age continues to rise, family planning programmes and healthcare services are having to run merely to keep with the growing number of women who need access to contraception.[10]

The International Conference on Population and Development (ICPD)
In 1994, shortly after the Rio Summit, the ICPD held in Cairo sought to determine global priorities and subsequent actions to address the relationship between demographic change and sustainable development. The conference resulted in a Programme of Action that covered a wide range of issues - including reproductive and maternal health and education; gender equality;

[5] http://esa.un.org/unpd/wpp/Excel-Data/fertility.htm
[6] Ibid.
[7] UN (2011), The Millennium Development Goals Report 2011, p. 32 http://mdgs.un.org/unsd/mdg/Resources/Static/Products/Progress2011/11-31339%20%28E%29%20MDG%20Report%202011_Book%20LR.pdf
[8] Ibid.
[9] Ibid.
[10] Ibid. p. 32

empowerment of women; migration; and urbanisation. In this regard, it specifically called for the establishment and maintenance of comprehensive and integrated demographic databases to enhance scientific capacity and local knowledge - something which the DESA Population Division and the Population Fund (UNFPA) have made considerable progress in.[11]

Building upon the emphasis Chapter 5 placed on increasing awareness of the fundamental linkages between women and demographic dynamics, the Conference specifically endorsed a new strategy focusing on the needs of individual men and women rather than more general numerical demographic targets. The programme therefore advocated increasing female choices through expanding access to education, health services and skill development. Reviews published every five years since the Conference (1999, 2004, 2009) have tracked progress in the implementation of the ICPD Programme of Action and have been crucial to the identifying replicable best practices and the remaining gaps in global efforts to effectively implement policies more focussed on the links between demography and sustainability. The reports reveal that notable progress has been consistently achieved in each of the focus areas of the Programme of Action; however there is still a considerable way to go before achieving universal access to reproductive health including family planning. They also emphasise that there is still insufficient analysis of the ways in which issues such as maternal and sexual health, the empowerment of women, migration and urbanisation each impact on resource use and distribution, as well as climate change adaptation and mitigation.

The Millennium Development Goals

Some of the main objectives of the Programme of Action were given further impetus by the 3rd and 5th Millennium Development Goals (MDGs) on the Empowerment of Women and Maternal Health respectively, with the latter including two targets to reduce the maternal mortality ratio by three quarters and to achieve universal access to reproductive health. As such, the main demography-oriented global policy efforts have been in these areas, with renewed effort to meet MDG targets reiterated at the Millennium Summit in 2010. The UN Population Division is directly mandated to provide key indicators on the reproductive health MDG targets. Progress in these areas has been marked, with developing regions as a whole, for instance, seeing the maternal mortality ratio fall by 34 per cent between 1990 and 2008.[12] Nevertheless, the majority of nations are still a considerable distance from reaching their overall targets for both Goal 3 and 5. Globally, there are still approximately 200 million women who lack effective and voluntary family planning services.[13] In addition, whilst overall levels of financial and technical assistance from developed countries for the provision of healthcare services has increased steadily in the last decade, funds specifically earmarked for family planning as a proportion of this total have declined; a trend consistent with the lack of prominence population-related issues have seen in international debates in the last ten years as focus has shifted towards sustainable consumption and production.[14]

Utilising demographic knowledge for sustainable development

Analyses on the interaction between environment, development and demographics have improved considerably since 1992 as a result of more advanced data collection on ecological footprints – which in turn have also been disaggregated according to water and carbon footprints, among others. The research and analysis of the Global Footprint Network[15], the Water Footprint

[11] http://www.un.org/esa/population/publications/countryprofile/intro.pdf
[12] The MDG Report 2011, UNDESA, p.21
[13] The Interface between Population, the Environment and Poverty Alleviation, EuroNGO's 2008 Annual Conference, Safiye Çağar, http://www.unfpa.org/pds/docs/safiye_speech.pdf, p.4.
[14] The MDG Report 2011, UNDESA, p.35; Population Dynamics and Climate Change, UNFPA & IIED, 2009, p.1.
[15] http://www.footprintnetwork.org

Network[16] and the WWF Living Planet Initiative[17] have provided helpful resources in this regard. The improved collection of data on country-level ecological impact has allowed a more comprehensive understanding of the often inverse relationship between population and per capita consumption. High fertility countries with burgeoning populations are not only likely to have lower ecological footprints overall, but also on an individual level once population has been taken into account. Conversely, many low fertility countries whose populations are likely to peak in the next twenty years have among the highest country ecological footprints, and even higher per capita footprints (as illustrated by Figure 2).

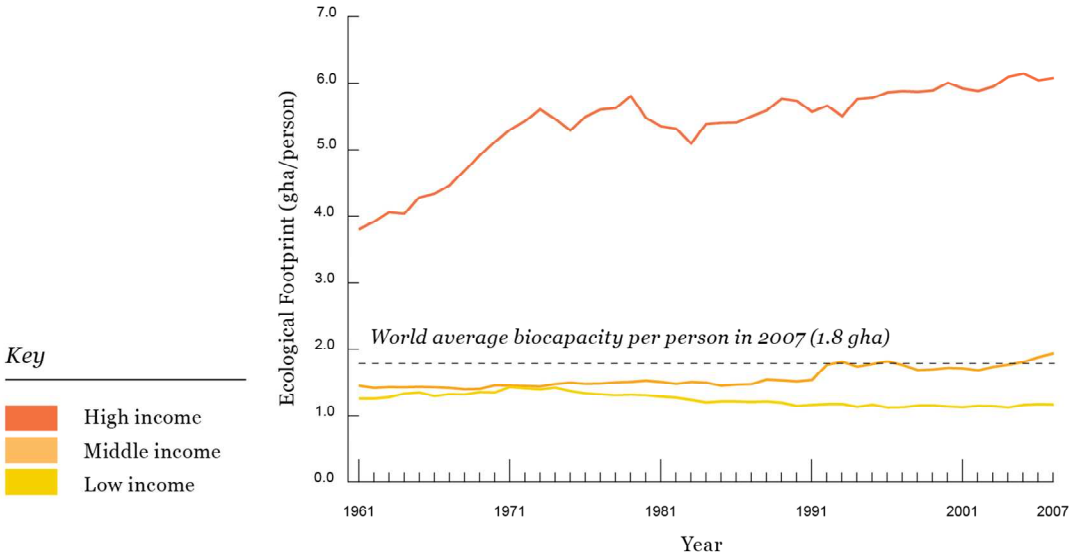

Figure 2. Changes in the ecological footprint per person in high-, middle- and low-income countries between 1961 and 2007
Note: The dashed line represents world average biocapacity in 2007.
Source: Global Footprint Network, 2010.

Numerous UN agencies, regional development bodies and NGOs have contributed extensively to a significant improvement in the clarity and quality of global population data and trends. This information is particularly valuable for strengthening interdisciplinary research programmes on demographic dynamics and providing decision-makers with current data analysis and projections in order to devise more informed policies.

However, though there has been greater focus on the interaction between population and sustainable development in the context of human impacts on the global environment, considerably more attention has been given to the interaction between population growth and broader development imperatives. This reflects more immediate concerns of managing demographic change in terms of infrastructure and service provision – especially in relation to rapid urbanisation. In this regard, Sub-Saharan Africa continues to see the world's highest rates of cross-border migration as well as an increasing trend of people moving from rural areas to urban centres; a phenomenon also particularly prevalent in much of Asia.[18]

[16] http://www.waterfootprint.org
[17] http://www.wwf.org.uk/what_we_do/about_us/living_planet_report_2010/
[18] International Migration and Development: Implications for Africa (Executive Summary), UNECA, 2006, p.1.

Globally, the ICPD and MDGs have continued to maintain focus on women's empowerment, maternal and reproductive health. In this context, analyses of the interaction between population and the environment may focus on the impacts of population growth and development on the surrounding environment. For example, the increased levels of waste and pollution, and the associated health implications these have at the local and national levels. But broader considerations of the effect demographic trends have on natural resource exploitation and global environmental change has received less attention.[19] This in part reflects the differentiated priorities placed on population growth by developed and developing countries – with Northern governments concerned about pressure on natural resources globally and the implications for food security, whilst their Southern counterparts are driven by more immediate social development imperatives.

Integrating Population Factors into National Sustainable Development Policies

The UNFPA remains a pivotal international development agency directly supporting countries in the use of population data to formulate policies aimed at reducing poverty; improve sexual and reproductive health; and further gender equality and the empowerment of women.[20] This has proved success in Nicaragua, for example, in which five years of strategic policy dialogue between the UNFPA, government agencies and other key stakeholders, saw the formal incorporation of population issues into poverty reduction strategies.[21]

DESA's Population Division has created an online multilingual encyclopaedic demographic dictionary called 'Demopaedia' — an important tool for Southern policy makers, also aiming to promote collaborative work on demographic research.[22] India's 2000 National Population Policy (NPP 2000) institutionalises their government's commitment to the provision of reproductive health care and family planning services, providing a policy framework for advancing goals and prioritizing strategies during the next decade to meet the country's significant reproductive and child health needs.[23] The empowerment of women is another demographic issue that has been addressed through various initiatives and laws in many developing countries, something which has been especially noticeable in African states, largely thanks to a gender policy framework adopted and promoted by the African Union.[24]

There have also been some noteworthy examples of local level responses to the effects of changing demographic dynamics on the environment. Regarding water resources, for example, a Moroccan case study recognised through regular population censuses that their population would double by around 2050 and for an already water scarce country this would present significant resource management issues. A joint project was initiated whereby population policies were linked to water resource management. The laws banning abortion and liberalising contraception were lifted and the legal status of women in society was reassessed while providing extensive sexual education and hygiene advice. At the same time irrigation policies were reassessed and decentralised management organisations created to modernise the infrastructure, improve management and local governance.[25] Local success stories of this nature have played a role in the formulation of more demographic-focused national policies for environment and development, and their further replication has in turn been greatly assisted by the establishment of new initiatives and legislation at the national and regional levels. There is still much to improve in this

[19] The Interface between Population, the Environment and Poverty Alleviation, EuroNGO's 2008 Annual Conference, Safiye Çağar, http://www.unfpa.org/pds/docs/safiye_speech.pdf, p.4.
[20] http://www.unfpa.org/public/cache/offonce/home/about;jsessionid=77577580E97E3EB4F3B208F54C674AA7.jahia01
[21] http://www.unfpa.org/pds/policy.html
[22] http://www.demopaedia.org/
[23] http://populationcommission.nic.in/npp_intro.htm
[24] Looking Back, Moving Forward: Results and recommendations from the ICPD-at-15 process, UNFPA, 2009, p.21.
[25] http://www.aaas.org/international/ehn/waterpop/morroc.htm

regard, however, with coordination between the central and local decision making levels often remaining low.

The Empowerment of Women, Reproductive Health and Family Planning Initiatives

Whilst limiting population size should not be considered a panacea for environmental protection and development, the introduction of human-rights-based policies to empower women and address unmet needs for reproductive health services have played an important role at the local level in changing consumption patterns and facilitating more sustainable forms of growth.[26] Noticeable advancements have been made since the Rio Summit towards women's empowerment, especially in many Southern countries whose governments have begun implementing the necessary legal and institutional frameworks to realise greater participation of women in decision making processes and socio-economic development.[27]

General trends in national policies that ensure the delivery of reproductive health and family planning services at the local level have shown improvement, however this varies significantly between regions and countries. The reach and quality of provision in the North is consistently high, and Southern nations still have a considerable distance to go. This is not always the case though. In some developing countries such as the Philippines, family planning costs have been formally factored into both local and national government budgets, therefore resulting in a marked improvement in service delivery.[28] In other nations such as Lesotho, community-based programmes have seen the training of local stakeholders to deliver family planning services. In this case as with others, a notable increase in the prevalence of contraception use has occurred, however, the unmet need still remains high in many instances, since demand tends to increase quicker than programmes expand.[29] At the international level, the recent creation of UN Women – the United Nations Entity for Gender Equality and the Empowerment of Women – in July 2010 represented a significant step forward in efforts to promote female rights and achieve gender equality, with the agency providing national governments with direct assistance to build the institutional capacity necessary to realise these goals.[30]

Challenges and Conflicts

Shortfalls in Understanding the Population-Environment Nexus

The relationship between population and environment remains complex and highly varied from one country to the next. Moreover, whilst progress has been made in assessing national population carrying capacities and analysing the more localised impacts of demographic dynamics on the environment, their linkages and effects on the global environmental system remain poorly understood. Most attempts at more integrated analysis have been limited in scope, focusing only on the narrow factors of population size and growth. This is pertinently exhibited by the projections of the Intergovernmental Panel on Climate Change (IPCC), which only incorporates global population size and growth into its emissions projections, 'without disaggregating or differentiating between the emissions levels of different social or demographic groups'.[31]

Like Chapter 5, the ICPD Programme of Action specifically called on governments to integrate their population, economic, environment and social policies, yet similarly to Agenda 21

[26] Population Dynamics and Climate Change, UNFPA & IIED, 2009, p.12.
[27] Looking Back, Moving Forward: Results and recommendations from the ICPD-at-15 process, UNFPA, 2009, p.21.
[28] Looking Back, Moving Forward: Results and recommendations from the ICPD-at-15 process, UNFPA, 2009, p.17.
[29] Looking Back, Moving Forward: Results and recommendations from the ICPD-at-15 process, UNFPA, 2009, p.18.
[30] http://www.unwomen.org/about-us/about-un-women/
[31] Population Dynamics and Climate Change, UNFPA & IIED, 2009, p.1.

insufficient attention was given to both the resources and techniques required to do so.[32] Further improvement in the coverage, consistency and comparability of demographic data is still necessary, however progress in this regard has been significant, especially at the global level.[33] What remains a far greater challenge, therefore, is using this information in conjunction with data on environment and sustainability to produce specific and implementable policy recommendations for national and local decision makers.

Prevailing Consumption Patterns

Various studies have concluded that Earth has reached or will shortly reach its ecological carrying capacity.[3435] This can be directly attributed to the disproportionately high consumption levels in developed countries which are not decreasing even though their populations are relatively stable. In this context, the projected incremental increase in global population – mainly as a result of contributions from the developing world where per capita ecological impact is at its lowest – will not be the primary driver of environmental degradation and climate change. However, there is still a strong possibility that as developing countries grow in population and continue to industrialise, they will make increasingly larger contributions to the global 'consumer class' and therefore have a far more severe effect on resource depletion and climate change.[36]

In the short-term, whereas increases in global population will have a telling but not necessarily unmanageable impact on the global environment, they will still put immense strain on the resources and institutions of developing nations, making socio-economic development increasingly difficult to attain. Freshwater is a critical issue in this regard, as its availability for both human consumption and food production remains insufficient in several regions. Currently, as many as 1 billion people are estimated to lack access to an adequate supply of safe water for household use, with some predictions based on high-end projections of population growth suggesting that in 30 years time as many as 5.5 billion will be living in areas suffering from moderate to severe pressure on water resources.[37]

Integrating Local Demographic Factors into Sustainable Development Strategies

Efforts to increase the empowerment of women and sufficiently improve maternal and reproductive health have been both widespread and effective. Nonetheless, there is still a considerable way to go before the international targets relevant to these issues are universally achieved. For maternal and reproductive health, the current challenges are twofold. Firstly, coverage still falls short of demand, with inadequate financial and human resources to close this gap.[38] The UNFPA is struggling to fulfil its mandate to oversee the implementation of the ICPD Programme of Action, largely due to shortfalls in finance commitments from industrialised states. Secondly, at both the planning and implementation stages, there remains a distinct lack of integration of said programmes with broader sustainable development strategies.

Both progress around demographic health issues and the empowerment of women also continue to be constrained by cultural and religious factors. The Catholic Church, for example, practiced by the majority of Latin Americans as well as large populations in Sub-Saran Africa, continues to

[32] The Interface between Population, the Environment and Poverty Alleviation, EuroNGO's 2008 Annual Conference, Safiye Çağar, http://www.unfpa.org/pds/docs/safiye_speech.pdf, p.3.
[33] http://www.un.org/esa/population/publications/countryprofile/intro.pdf
[34] See for example: http://earthtrends.wri.org/updates/node/360
[35] Rockström, J et al. Planetary boundaries: Exploring the safe operating space for humanity. *Ecology and Society* [online] 14, 32 (2009). www.ecologyandsociety.org/vol14/iss2/art32.
[36] Gardner, G., Assadourian, E., and Sari, R. (2004) The State of Consumption Today, Chapter 1 in, The State of the World Today http://www-rohan.sdsu.edu/faculty/dunnweb/StateofWorld2004.dat.pdf, p7
[37] http://www.aaas.org/international/ehn/waterpop/desherb.htm
[38] The MDG Report 2011, UNDESA, p.35; Population Dynamics and Climate Change, UNFPA & IIED, 2009, p.1.

eschew many modern family planning methods. In some Islamic countries, female empowerment is often hindered by deep-rooted patriarchal hierarchies, preventing the participation of women in both the economic and political spheres.

Migration and Urban Density

Migration has become an increasingly critical policy issue for governments in both North and South. Nonetheless, it is still generally perceived as problematic, with strategies to cope with intensified migration usually attempting to influence the volume, direction and types of movement rather than accommodate flows and support migrants. This serves to heighten fears that climate induced augmentations in migration rates will result in policies that do little to protect the rights of those most vulnerable to the effects environmental change.[39] Both the causes of – and the capacity to cope with - the socio-economic and environmental implications of mass migration are directly affected by political unrest and the fragility of state institutions. This remains a particularly acute problem in many parts of Sub-Saharan Africa such as Zimbabwe and the DRC, as well as many areas in Asia, like Nepal, Burma and large parts of the Middle East for instance.

Like migration, the continuation of rapid urbanisation processes are not necessarily detrimental to development or environmental prospects as such, however these processes are occurring in a poorly planned and badly managed fashion in the vast majority of Southern countries. Deficiencies in the quality of provision of housing, water and energy provision, sanitation and transport infrastructure all pose a major challenge to the implementation of effective integrated environmental and development programmes in urban areas. Furthermore, poor urban planning significantly heightens vulnerability to the effects of climate change such as flooding, waterborne disease and food shortages, with increasing population densities in urban sprawls the human and economic impact of natural disasters are greatly exacerbated.[40]

Way Forward

Improving Understanding of the Demographic-Environment Relationship

Public discourse on the relationship between demographic dynamics and sustainability must become sophisticated enough to avoid a revival of pre-Cairo attitudes in which a teleological link between population growth and environmental crisis was assumed.[41] The nexus between population and the environment remains highly complex and context specific. Moreover, there remains a clear need for 'broader, more nuanced, evidence-based perspectives' on how population data can inform responses to environmental challenges, in terms of both mitigation and adaptation.[42] This will require concerted efforts to further accentuate multidisciplinary research into the population-environment relationship, needing inputs from a wide range of stakeholders including those regarding the practices and perceptions of local communities. The forthcoming Royal Society report entitled 'People and the planet: the role of global population in sustainable development?' will provide important new analysis and policy recommendations in this regard.[43] The capacity of decision makers to both understand and use this information to formulate effective policies must also be developed.

[39] Population Dynamics and Climate Change, UNFPA & IIED, 2009, p.105.
[40] Population Dynamics and Climate Change, UNFPA & IIED, 2009, p.71.
[41] The Interface between Population, the Environment and Poverty Alleviation, EuroNGO's 2008 Annual Conference, Safiye Çağar, http://www.unfpa.org/pds/docs/safiye_speech.pdf, p.4
[42] Population Dynamics and Climate Change, UNFPA & IIED, 2009, p.2.
[43] http://royalsociety.org/people-and-the-planet/

Programmes of education to mainstream the environment associated challenges posed by changing demographics as well as potential paths to more sustainable population trends will also be important. Whilst this type of initiative will not necessary produce tangible results in terms of directly leading to national policies which better integrate population dynamics into socio-economic policies, it has the potential to play an important role in refocusing the significance of demographic and sustainable development interactions in all sectors of society.

Integrating Consumption into Demographic Analyses and Policy

As discussed in the State of Implementation section, the incorporation of consumption trends into demographic considerations is crucial to a more comprehensive understanding and management of population related issues. There must be a clearer focus on how individual and regional specific demographic dynamics will currently, and in the future, affect patterns of consumption – in terms of what practices need to end as well as what needs to happen. It is through increasing understanding of these relationships that governments will be best equipped to both mitigate climate change and enable their populations to cope with its effects.

This would perhaps suggest a clear division between the role of demographic dynamics in policy formulation in the developed and developing worlds. Demographic trends in the North should be used to better inform strategies which focus on reducing unsustainable processes of production and consumption. In the South, however, governments should primarily focus on aspects of population growth that present challenges to their own sustainable development. In this respect Global Economic Institutions (GEIs), NGOs and Northern governments must each support environmental 'leap-frog development' to prevent unsustainable resource use of a similar magnitude to historical Northern development.

Reproductive Health and Family Planning Initiatives

Urgent action is still required to further empower women and improve sexual health. Furthermore, to meet current demand, national support and levels of funding must rise significantly, as well as improving the national mechanisms to deliver this support vis-à-vis the capacity. It is essential that multilateral support for programmes to address these issues increases in its own right, without being tied to other programmes, as this would risk a return to governments imposing more oppressive population targets and controls.[44] Improving and increasing local participation in the design, delivery and evaluation of these services is a key precondition to broadening access and ensuring provision meets demand, as well as simultaneously stimulating local economic prosperity.[45] In this respect, the integration of national targets and community programmes on maternal and reproductive health must be prioritised in all nations currently failing to meet MDG targets, drawing upon examples from countries in which progress in these areas have been more pronounced.

Migration and Urban Planning

In many countries, both political and public attitudes to migration must transcend zero-sum logic which sees urban growth from migration in a generally negative light and therefore something to be simply halted. Global migration is a complex and difficult issue, but its effective management remains integral to the maintenance of national and cultural stability and development at the national, sub-regional and regional levels.[46] There is therefore an imperative to build capacity at the institutional level while at the same time educating the public on issues surrounding migration. International migration rates and impacts will remain tied to political and economic

[44] Population Dynamics and Climate Change, UNFPA & IIED, 2009, p.7.
[45] http://www.aaas.org/international/ehn/waterpop/desherb.htm
[46] International Migration and Development: Implications for Africa (Executive Summary), UNECA, 2006, p.1.

stability – the attainment of which in especially fragile countries must remain a strong priority for the international community.
Similarly, processes of internal migration must be more effectively prepared and coordinated if negative impacts on environment and development are to be minimized.

Chapter 6: Protecting & Promoting Human Health

Introduction

Chapter 6 of Agenda 21 focuses on protecting and promoting human health through understanding its relationship with development objectives and the environment. As stated in the Chapter, "the linkage of health, environmental and socio-economic improvements requires inter-sectoral efforts".[1] It put forward five main programmes of actions in order to achieve improvements in human health which deal with three broad themes: ensuring direct health services reach those most in need; developing national strategies that consider the multi-sector approach needed for protecting human health and to be able to generate and use funding more effectively; and understanding and dealing with the root causes of many health issues.

Implementation

Primary Healthcare

While the overall life expectancy in low income countries has increased overall from 64 years in 1990 to 68 years in 2008,[2] progress towards Millennium Development Goals (MDGs) 4, 5 and 6 - those dedicated to health issues - has been varied. Child mortality has reduced from 100 deaths per 1000 live births in 1990 to 72 in 2008 with an increased rate of reduction of 2.3% since 2000, however, 1 in 4 children are still underweight and progress is not increasing fast enough to meet the MDG. The number of newborn deliveries attended by a skilled health professional has increased from 53% to 63% in the same time period, and while there are reductions in the maternal mortality rate, this is not at the 5.5% level needed. Emphasis on family planning and contraceptive use has been growing, but with reduced funding in recent years (8.2% to 3.2% of overall external funding for health) progress may become difficult. Rural/urban disparities are still common with only 1 in 3 women receiving the recommended care during pregnancy in rural areas. Progress in reducing the number of teenage pregnancies has stalled, putting more young mothers at risk.[3]

Communicable Diseases

The spread of HIV/AIDS has stabilised and the number of newly infected cases had dropped from 3.5 million in 1990 to 2.7 million in 2008 and 2.9 million deaths have been averted due to treatment of pregnant women to reduce mother-to-child transmission. Malaria has gained increased attention with numerous international donor agencies, NGOs and private bodies now investing time and money into its eradication but the impact of this has not been felt yet - in 2008, there were still 243 million cases with 863,000 deaths.[4] Progress in eradicating TB is also progressing slowly after a peak in 2004 with 143 cases per 100,000 people but the slow rates of reduction are outweighed by increases in population growth.[5] Diarrhoeal diseases are a significant factor in child mortality rates[6] and increased emphasis is beginning to be placed on the

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1 Agenda 21, Chapter 6 (1992) http://www.un.org/esa/dsd/agenda21/res_agenda21_06.shtml

2 World Health Statistics 2010, URL: http://www.who.int/whosis/whostat/EN_WHS10_Part2.pdf, p.56

3 Millennium Development Goal Report 2010 URL: http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf

4 Financial Times Special Report: Combating Malaria (April 24th 2009) URL: http://media.ft.com/cms/e4edf59c-2f1d-11de-b52f-00144feabdc0.pdf

5 Millennium Development Goal Report 2010 URL: http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf

6 UN Water (2011) Sanitation: 5 Year Drive to June 2015 Factsheet 5 URL: http://www.sanitationdrive2015.org/factsheets/Sanitation-sustains-clean-environments.pdf

environmental factors at their root cause, i.e. MDG 7. Access to safe, clean drinking water has made good progress since 1990. However, access to adequate sanitation has made little progress and, in the words of the Millennium Development goals report 2010, the 2015 target for sanitation appears out of reach. Access to water and sanitation has gained international recognition over the years, and was named a Human Right in 2010.[7]

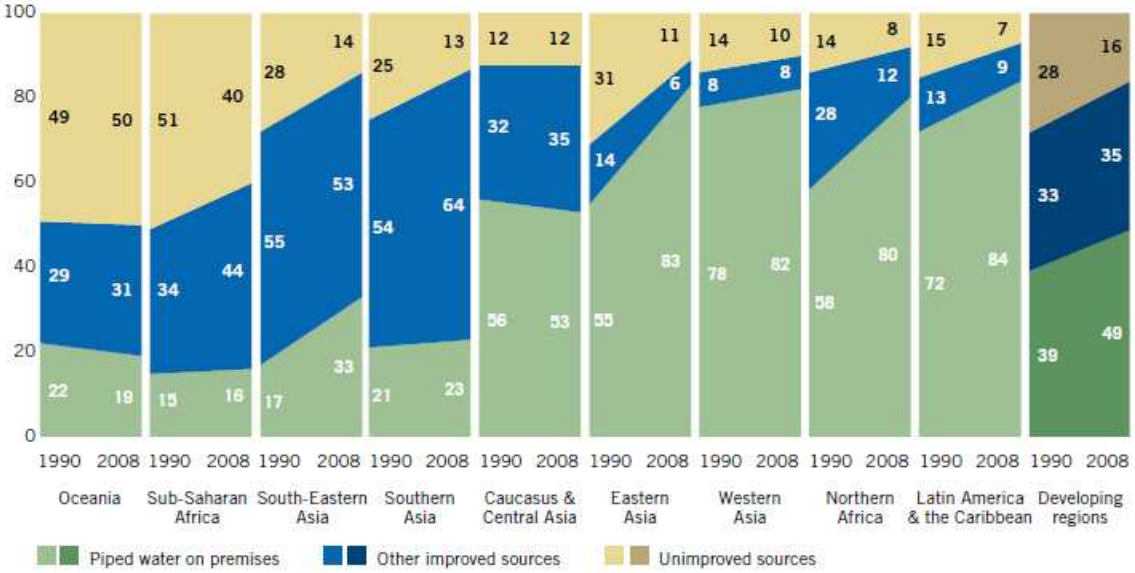
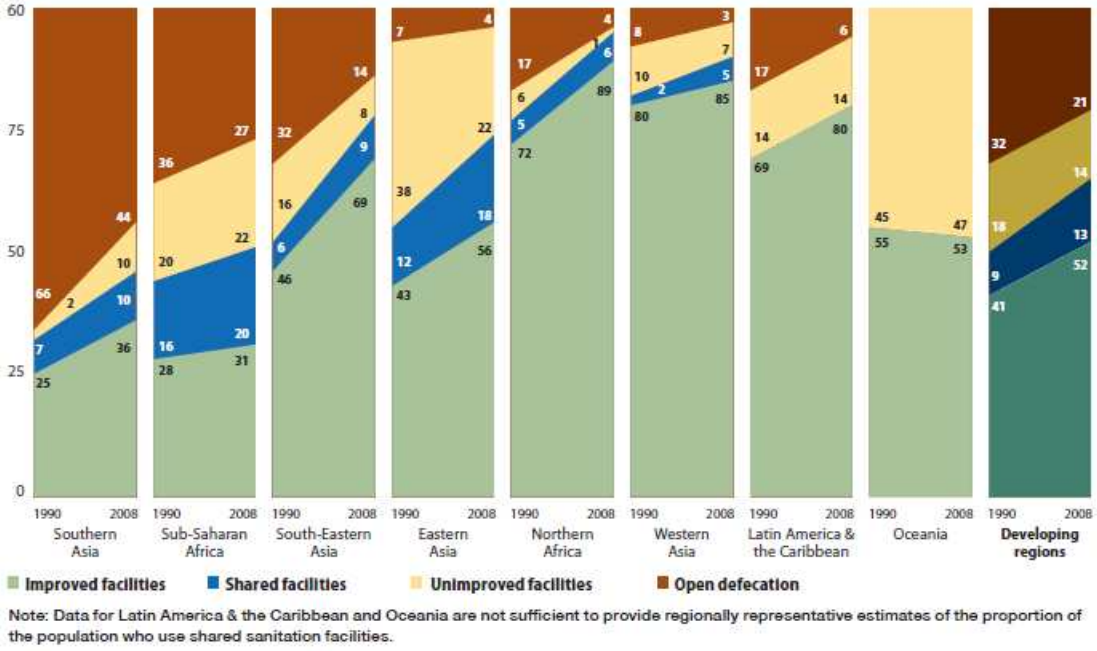


Figure 1: Population using different sources of water, 1990 and 2008
Source: UN-DESA, Millennium Development Goals Report, 2011.



Note: Data for Latin America & the Caribbean and Oceania are not sufficient to provide regionally representative estimates of the proportion of the population who use shared sanitation facilities.

Figure 2: Proportion of population by sanitation practices, 1990 and 2008
Source: UN-DESA, Millennium Development Goals Report 2010.

[7] UN New Centre (28th July 2010) URL: http://www.un.org/apps/news/story.asp?NewsID=35456&Cr=SANITATION

Environmental Hazards

Environmental health hazards such as indoor air pollution, one of the biggest killers in the developing world particularly of women and children are currently receiving very little attention.[8] Additional health problems are prevalent in urban centres which are hotbed for environmental health hazards particularly within slums and untenured settlements. The population of slum dwellers has now exceeded 1 billion.[9] In Sub-Saharan Africa, for example, approximately 62% of the urban population lives in slums.[10] Future growth is expected to pose even more pressure on municipal centres and health strategies.

Box 1: International Cooperation

In 2005, WHO members adopted the General Assembly Resolution 58:633 committing to the development of financial systems to enable access to services for all and no financial hardships for receiving treatment.
World Health Report 2010

The Global Alliance for Vaccinations and Immunisations (GAVI) has committed to date US$568 million to strengthen health systems in 53 countries and overcome bottlenecks in achieving MDGs.
GAVI Progress Report 2010

The International Health Partnership and Related Initiatives (IPH+), launched 2007, seeks to mobilise donor countries and other development partners around a single country led national health strategy thus streamlining the funding process for increased efficiency and reduced transaction costs.
IHP+ 2011

All work on the principles of the Paris Declaration on Aid Effectiveness and the Accra Agenda for Action placing country ownership at the centre.

World Health Report 2010

National Health Plans and International Cooperation

With global health targets looming, the development of health plans, as well as broader health sector strategies, is receiving particular attention through such regional and global initiatives as the Africa Health Strategy 2007-2015 and the International Health Partnership, as well as the Global Action Plan on Human Resources for Health.[11] In the last decade, international cooperation has increased significantly with numerous initiatives established to help developing countries develop robust health systems that are cost-effective, efficient and address the interrelationship between health, development and the environment; and to help streamline the fragmented nature of health ODA (Box 1).[12] However, the proportion of ODA channelled to promoting human health, both directly through the provision of health care services and indirectly through health sector policy, planning and programmes, medical education, training and research, and medical (non-basic) health services, is not enough to achieve the targets of the MDGs and reduce the risks associated with other health problems - in 2006, ODA for health was between US$9-16 billion in 2009,[13] over US$20 billion short of what is estimated to be needed.[14]

[8] Millennium Development Goal Report 2010, p.62 UNDP
http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf
[9] UN-HABITAT, Former Executive Director, Statements and Speeches, "Urban Housing Challenges and Opportunities in Developing Countries http://www.unhabitat.org/content.asp?cid=1345&catid=14&typeid=8&subMenuId=0
[10] HABITAT Quick Guide 1: Housing the Poor in African Cities – Urban Africa: Building with Untapped Potential; URL: http://www.unhabitat.org/pmss/listItemDetails.aspx?publicationID=3115
[11] WHO Guiding Principles for National Health Workforce Strategies p.2, http://www.who.int/healthsystems/round9_6.pdf
[12] World Health Report 2010, Exec Summary, http://www.who.int/whr/2010/en/index.html
[13] OECD Statistics
http://stats.oecd.org/qwids/#?x=3&y=6&f=2:262,4:1,5:4,9:85,7:2,1:1&q=2:262+4:1+5:4+9:85+7:2+1:1+3:251,254+6:2005,2006,2007,2008,2009

Challenges and Conflicts

National Health Strategies and Funding

The World Health Report 2010 outlined three fundamental interrelated problems restricting progress in national health strategies: availability of resources, over-reliance on direct payments at the time people need them, and inefficient and inequitable use of resources.[15]

Box 2: Gabon Innovation

To raise more funds for the national health strategy, Gabon implemented a tax on mobile phone companies and used the profits to cover the sections of the population not economically capable of contributing to the National Health Insurance. In 2009, this amounted to US$25 million. The country also imposes a 1.5% levy on companies handling remittances which added another US$5 million to the total.

World Health Report 2010, Background Paper 13

The likely costs of achieving the health MDGs and establishing intervention programmes to overcome non-communicable diseases in 49 lower-income countries has been estimated as US$60 per capita by 2015 whereas the current projected amount of spending by 2015 will be only US$32.[16] Domestic funding is generally low as most countries have few public funds to invest into the health system. Few African countries have reached the target set in the 2001 Abuja Declaration to spend 15% on government budget on health, and in fact 19 countries who signed have now allocated less.[17] The effect of this is that over 50% of those needing medication have to buy it privately at 630% above the international reference price, and this further marginalises vulnerable groups (Table 1). Being able to subsidise health care for these marginalised groups is seen as essential to ensuring that the majority of developing country populations receive the healthcare they need and to reducing the health burden on the economy.[18] Currently, many health care systems rely on out-of-pocket payments by those receiving treatment[19]. The amount of Overseas Development Assistance (ODA) being given to health initiatives in the future is currently uncertain due to the financial crisis and a reduction in overall ODA, thus countries are being encouraged to find more innovative ways of raising funds for their health systems (Box 2).[20] Direct payments at the time of treatment are seen to be one of the biggest obstacles facing progression in the health system of many countries, preventing millions of people from accessing vital health care and placing unsustainable financial burdens on those who do.[21] Evidence has shown that the countries which moved to a pre-payment or insurance based system have been more successful in achieving improvements in their national health systems.[22]

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[14] International Health Partnership (2007) What types of funding exist and how can we make funding for health for efficient and predictable? www.internationalhealthpartnership.net/pdf/IHP%20Update%2013/Taskforce/london%20meeting/ANDERS%20MOLIN%20FINAL.pdf

[15] World Health Report 2010, Exec Summary, http://www.who.int/whr/2010/en/index.html

[16] World Health Report 2010, Exec Summary, http://www.who.int/whr/2010/en/index.html

[17] World Health Report 2010, Exec Summary, http://www.who.int/whr/2010/en/index.html

[18] World Health Statistics 2011 p.19 http://www.who.int/whosis/whostat/EN_WHS2011_Full.pdf

[19] Disease Control Priorities Project, (2008), Disease Control Priorities in Developing Countries, 2nd Edition, URL: http://www.dcp2.org/pubs/DCP

[20] World Health Report 2010, http://www.who.int/whr/2010/en/index.html

[21] World Health Report 2010, http://www.who.int/whr/2010/en/index.html

[22] World Health Report 2010, Exec Summary, http://www.who.int/whr/2010/en/index.html

Table 1. National spending on health services

	Health Expenditure per capita US$ (2001)	Health Expenditure as % of GDP	Public Sector Expenditure as % total spent on health
Low Income	23	4.4	26.3
Middle Income	118	6.0	51.1
High Income	2841	10.8	62.1
(Europe)	(1850)	(9.3)	(73.5)
World	500	9.8	59.2

Source: World Health Statistics 2011:19

Health System Inequalities

Inequalities between rich and poor, and rural and urban will not be automatically resolved by increasing the amount of public spending per capita – for example, transport costs for a rural inhabitant to travel to the nearest health facility can be just as prohibitive as the charges imposed, and likewise, the loss of income incurred by taking the trip can outweigh the health implications of not seeking health care.[23] The World Health Report 2010 stated that, "closing this coverage gap between rich and poor in 49 low income countries would save the lives of more than 700,000 women between now and 2015".[24]

Multi-sector Approach

There are also tensions found in the health sector between the institutional and bureaucratic base of delivery of direct health care services such as doctors and clinics, and the lack of influence the sector has on other sectors in charge of some of the most important determinants of health i.e. water and sanitation, housing and transport, that need to be overcome[25]. Effective national health systems need to not only focus on direct access to quality health services, but other factors in society that affect the population's health – education, housing, food, and employment, for example, all impact on people's health[26]. The lack of capacity that many countries face has led many governments to follow a few high priority programmes such as immunisation drives that deliver results quickly and effectively, but in doing so have missed the opportunity to develop longer term strategies that consider the root causes to these problems[27] - for example, approximately one quarter of the global disease burden and over one third of the burden among children is due to modifiable environmental factors[28].

Environmental Factors in Communicable Diseases

Today, 90% of diarrhoeal diseases are linked to environmental pollution which is one of the main killers in developing countries, especially for children under the age of five.[29] The usual cause of diarrhoeal diseases is lack of safe drinking water, inadequate sanitation and lack of hygiene. It is still the case that a child can be vaccinated against rotavirus[30] and still die from typhoid, shigella,

[23] World Health Report 2010, URL: http://www.who.int/whosis/whostat/2011/en/index.html
[24] World Health Report 2010, URL: http://www.who.int/whosis/whostat/2011/en/index.html
[25] IIED Human Settlements Discussion Paper Series: "Urban Environments, Wealth and Health, shifting burdens and possible responses in low and middle income nations http://pubs.iied.org/pdfs/10553IIED.pdf
[26] World Health Report 2010, URL: http://www.who.int/whosis/whostat/2011/en/index.html
[27] Disease Control Priorities Project, (2008), Disease Control Priorities in Developing Countries, 2nd Edition, URL: http://www.dcp2.org/pubs/DCP
[28] Prüss-üstün, A and Corvalán, C. (2006) Preventing Disease Through Healthy Environments: Towards an estimate of the environmental burden of disease, WHO, URL: http://www.who.int/quantifying_ehimpacts/publications/preventingdiseasebegin.pdf
[29] UN Water (2011) Sanitation: 5 Year Drive to June 2015 Factsheet 5 URL: http://www.sanitationdrive2015.org/factsheets/Sanitation-sustains-clean-environments.pdf
[30] Rotavirus is one of the main types of diarrhoeal diseases especially amongst children under the age of 5. It causes damage to the intestines and frequent vomiting, diarrhoea, vomiting and dehydration. Most symptomatic episodes occur between 3 months and 2 years of age, with a peak incidence between 7 months and 15 months. Outbreaks in day-care centres and hospitals can spread rapidly among non-immune children. Children from low socioeconomic backgrounds and low birthday weight infants have an increased risk of hospitalisation. (WHO Initiative for Vaccine Research - http://www.who.int/vaccine_research/diseases/diarrhoeal/en/index5.html)

E. Coli, or any other number of deadly diarrhoeal diseases.[31] Improved sanitation can decrease diarrhoeal illnesses by 34% yet 1.2 billion people still practice open defecation.[32] Sanitation is among the MDG targets lagging the farthest behind and combined with lack of access to clean safe drinking water, is resulting in significant health costs (Box 5).[33]

Malaria

In the last half a decade, attention towards malaria has grown with increased involvement from numerous international aid agencies and foundations.[34] However, in the last year there were 247 million cases worldwide that resulted in 881,000 deaths. The spread of impact is highly unequal with 91% of the deaths occurring in Africa[35]. While there has been a staggering increase in the number of children under five years old now sleeping under a net in many endemic countries (Table 2), the unequal distribution of malaria control schemes has meant that the poorest 20% have received over 50% less than the richest 20%.[36] In addition, artemisinin based combination therapy is effective but expensive, and while external assistance for malaria to endemic countries has risen from less than US$0.1 billion in 2003 to US$1.5 billion in 2009 it is far short of the estimated US$6 billion needed in just one year.[37] The economic toll of malaria is estimated to be a US$12 billion loss in productivity and cost of treatment in Africa alone[38] and the total health burden is equal to 33.5 million Disability Adjusted Life Years.[39]

Table 2: Proportion of Children <5 years old sleeping under a mosquito net (%)

	2000	2008/9
Rwanda	4	56
Kenya	3	46
Madagascar	0	45
Zambia	1	46

HIV/AIDS

HIV/AIDS remains the world's largest killer despite progress made in reducing the number of newly infected people (2.7 million in 2008) and mortality rates (2 million per annum) with the provision of antiretroviral treatment (ART).[40] However, with people living longer the absolute total of people living with the virus has been increasing. In 2008 it was estimated that 33.4 million people were living with HIV/AIDS in 2008 and 42% of them were receiving treatment.[41] The rate of new infections is outstripping expansion of treatments such that for every 2 people who receive ART each year, another 5 become infected. In 2008, 5.5 million people in low and middle income

[31] Water Aid (16.6.2011) Call for vaccination programmes to address water and sanitation crisis, URL: http://www.wateraid.org/international/about_us/newsroom/9839.asp
[32] World Health Statistic Report 2011 http://www.who.int/whosis/whostat/EN_WHS2011_Full.pdf
[33] UN Water, Sanitation: 5 Year Drive to 2015 Factsheet 4 http://www.sanitationdrive2015.org/factsheets/Sanitation-is-a-good-economic-investment.pdf
[34] Including the World Bank's Booster Programme in 2005; George W. Bush's President's Malaria Programme in 2005; business involvement with the US$100 million Malaria Capital Campaign and in 2007, the Bill and Melinda Gate's Foundation – (Financial Times Special Report: Combating Malaria (April 24th 2009) URL: http://media.ft.com/cms/e4edf59c-2f1d-11de-b52f-00144feabdc0.pdf)
[35] Rollback Malaria Key Facts URL: http://www.rollbackmalaria.org/keyfacts.html
[36] Millennium Development Goal Report 2010 p.48 http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf
[37] Millennium Development Goal Report 2010, p.48 http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf
[38] Financial Times Special Report: Combating Malaria (April 24th 2009) URL: http://media.ft.com/cms/e4edf59c-2f1d-11de-b52f-00144feabdc0.pdf
[39] Rollback Malaria Key Facts URL: http://www.rollbackmalaria.org/keyfacts.html
[40] Millennium Development Goal Report 2010, p.41 http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf
[41] Ibid., p.41.

countries did not receive any treatment.[42] The regional spread of the virus is still grossly unequal with 22.4 million of the total 33.4 million living in Sub-Saharan Africa[43] and it has been found that in the hardest hit countries, national wealth has been reduced by 15-20% by reducing the economically active proportion of the population and through increased health costs.[44] Youth are most at risk from new infections with HIV/AIDS and while condom use is gaining in acceptability, the latest figures show that less than 50% of young men and less than 30% of young women used a condom during their last higher risk sexual activity.[45]

Urban Centres

Urban areas harbour some of the widest disparities and inequalities between sections of the population and health factors are some of the most poignant.[46] More than 1 billion people (a third of urban dwellers) live in slums, where their life expectancy is significantly decreased - for example, a child in a slum in Nairobi is four times more likely to die before the age of five than in other parts of the city.[47] Communicable diseases, for these above reasons and due to the compactness of the settlements, are more likely to cause epidemics than in rural areas.[48] Environmental factors in the community are also more prevalent for people living in the poorer areas of the city which tend to be located next to polluting factories and industry, nearer to busy roads where exhaust fumes are more prevalent. The poor also tend to be occupied in more vulnerable, risky jobs.[49] Urban areas are usually better provided with health centres and qualified health workers in comparison to rural areas, but they are not always accessible to the urban poor. In many cases urban dwellers have to pay a much larger sum for health services compared to rural areas, and that the health service is not always better or of any quality.[50]

Environmental Hazards

Overcoming environmental hazards has also made little progress. At the household level in both urban and rural areas, the most lethal environmental hazard in scale and mortality is indoor air pollution ranked fourth in terms of risk factors that contribute to disease and death.[51] There are over 1.6 million deaths annually from respiratory diseases associated with indoor air pollution of which over 50% are children under 5 years old, and women are also disproportionately affected due to their cooking roles at home.[52] The WHO has estimated that 52% of the world's population cooks and heats their homes with solid fuels and 2.4 million of the poorest rely on biomass which can exceed the ambient air pollution standards by a factor of 2 to 60 and in many cases the smoke can be the equivalent of smoking two packets of cigarettes each day.[53] In order to halve the number of people without access to clean fuels by 2015, 485,000 people would need to gain

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[42] Ibid.,p.45.
[43] Ibid.
[44] UN AIDS/World Bank Press Release (2000) "AIDS hindering economic growth, worsening poverty in hard hit countries", http://www.thebody.com/content/art641.html
[45] Millennium Development Goal Report 2010, p.45 http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf
[46] UN-HABITAT, Former Executive Director, Statements and Speeches, "Urban Housing Challenges and Opportunities in Developing Countries http://www.unhabitat.org/content.asp?cid=1345&catid=14&typeid=8&subMenuId=0 [accessed 03.07.2011]
[47] WHO World Health Day 2010 FAQs http://www.who.int/world-health-day/2010/media/whd2010faq.pdf
[48] Live Mint, The Wall Street Journal, http://www.livemint.com/2010/07/14173044/Emerging-urban-health-challeng.html
[49] IIED Human Settlements Discussion Paper Series: "Urban Environments, Wealth and Health, shifting burdens and possible responses in low and middle income nations http://pubs.iied.org/pdfs/10553IIED.pdf
[50] Mark Montomery (2009) Population Bulletin: Urban Health and Poverty in Developing Countries Vol 64, No.2 http://www.prb.org/pdf09/64.2urbanization.pdf
[51] Millennium Development Goal Report 2010, p.62 UNDP http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf
[52] WHO Indoor Air Pollution Publication, part I http://www.who.int/indoorair/publications/fflsection1.pdf
[53] WHO & UNEP Health and Environment Linkages Initiative (HELI) (2011) http://www.who.int/heli/risks/indoorair/indoorair/en/index.html

access every day for the next 10 years which would cost US$13 billion per year by supplying them with liquid petroleum gas. However, the payback rate would be US$91 billion per year.[54]

Way Forward

Having a robust national health system is seen as imperative to reducing the health impacts on the country's population which includes stable funding and use of resources.[55] The challenges being experienced by numerous health issues are in large part due to a lack of money whether from international funds or domestic economy. International assistance may start to help in this regard in the near future after some of the world's largest pharmaceutical companies agreed to slash their vaccine prices to make them more affordable to poor countries.[56] National health strategies are being encouraged to establish new and more effective ways of raising domestic funds for improving their population's health.[57] The World Health Report 2010 puts forward a number of suggestions of how countries could do this such as a tax on products already harmful to health, i.e. a 50% increase in tobacco excise taxes would generate US$1.42 billion[58].

The equitable aspect of health interventions is also an area that needs to be focused upon in the future. When dealing with coverage issues, the tendency has been to put efficiency over equitability, whereas an equitable health system needs to reach the rural and poor areas that are currently cut off, and thus national health strategies need to establish the right line between efficiency and equality.[59] In Southern Asia for example, an urban woman is twice as likely to have skilled care whilst giving birth than someone in a rural location, although this is an improvement from three times in 1990.[60] Conversely, the most progress to have been made in improving sanitation has been achieved in rural areas compared to urban areas, thus showing that resolving the coverage gap between urban and rural is more complex than just channelling more resources into one or the other area and shows the need for targeted and specific policies.[61] Closing the coverage gap between rich and poor in 49 low income countries would save the lives of more than 700,000 women between now and 2015 whilst closing the coverage gap for a range of services for children younger than 5 years old, particularly routine immunisations, would save more than 16 million lives.[62]

There are two changes in overall focus in the near future. Firstly, as the urban population continues to grow exponentially, international development attention will be occupied here more than rural areas. While this makes sense, it is imperative that the remaining rural population is not left behind, and that the current emphasis in Agenda 21 Chapter 6 on ensuring primary healthcare needs are met in rural locations must continue as an imperative aim and should not be reduced.[63] However, simultaneously, the problems associated with urban areas must also receive increased

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[54] WHO Indoor Air Pollution Publication, part I http://www.who.int/indoorair/publications/fflsection1.pdf
[55] World Health Report 2010, URL: http://www.who.int/whosis/whostat/2011/en/index.html
[56] Water Aid (16.6.2011) Call for vaccination programmes to address water and sanitation crisis, URL: http://www.wateraid.org/international/about_us/newsroom/9839.asp
[57] World Health Report 2010, http://www.who.int/whr/2010/en/index.html
[58] World Health Report 2010, Exec Summary, http://www.who.int/whr/2010/en/index.html
[59] World Health Report 2010 http://www.who.int/whr/2010/en/index.html
[60] Millennium Development Goal Report 2010 p.31 URL: http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf
[61] Millennium Development Goal Report 2010 p.61 URL: http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf
[62] World Health Report, Exec Summary, p. 8 World Health Report 2010, Exec Summary, http://www.who.int/whr/2010/en/index.html
[63] Sheng, (2002) Poverty Alleviation Through Rural-Urban Linkages: Policy Implications, Economic and Social Commission for Asia and the Pacific, URL: http://www.unescap.org/pdd/prs/ProjectActivities/Ongoing/Rural-Urban%20Linkages/Rural-Urban%20Linkages-policyimp.pdf

funding and attention as they escalate.[64] Secondly, environmental problems are changing. As efforts are made to reduce the risks posed by environmental hazards and environmental factors in communicable diseases, the potential effects of climate change must be considered as some of its impacts, such as flooding mixing open waste with drinking water, will make progress harder.[65] The effects of climate change on development will increase in impact constraining access to natural resources, affecting agricultural production and provision of basic services for overcoming the exacerbation of environmental hazards. The emphasis of Agenda 21 Chapter 6 on the local and community level environmental hazards is imperative to continue, but with consideration of the now global environmental issues affecting development.

[64] Beall, Jo and Fox, Sean (2007) "Urban Poverty and Development in the 21st Century: Towards an Inclusive and Sustainable World", Oxfam Research Report URL: http://www.oxfam.org.uk/resources/policy/trade/downloads/research_urban_poverty.pdf

[65] UN-HABITAT Global Report on Human Settlements (2009) p.xxiii, URL: http://www.unhabitat.org/downloads/docs/GRHS2009/GRHS.2009.pdf

Chapter 7: Promoting Sustainable Human Settlement Development

Introduction

At the time of Agenda 21, human settlement conditions in many parts of the world, particularly in developing counties, were deteriorating with little public expenditure going towards improving them.[1] This was particularly the case in urban areas where increasing numbers of people were living. In the run up to the 1992 United Nations Conference on Environment and Development (UNCED) there was a move in focus towards the increasing urbanisation of developing countries. In 1990, less than 40% of the global population lived in a city. Soon after, the growth of urban areas began to accelerate until in 2010, more than half of all people lived in an urban area.[2] While the focus of Chapter 7 is not solely on urban settlements, Agenda 21 did place particular focus, with an obvious view to the future, on urban growth and sustainable urban planning.[3]

Implementation

Provide adequate shelter for all

There are a few examples of national governments in developing countries establishing initiatives to overcome what is being referred to as the "urbanisation of poverty". Thailand's Urban Community Development Office (UCDO) has been active for almost two decades (Box 1) and Indonesia's Kampung Improvement Programme, from 1969, has paved the way for improved relationships between low-income settlements and local authorities (Box 2).

Box 1: Urban Community Development Office, Thailand

"Set up in 1992 under the National Housing Authority, it has supported urban communities through savings and loan schemes for income generation and slum upgrading. It has proved so successful that it has recently been enlarged to include rural community development. With such support, Thai urban poor communities have, in the past decade, consolidated their organisations firstly through resisting evictions and more recently through strengthening savings and credit groups, federating them and creating networks of urban poor organisations in various regions, and around issues and common circumstances. With these changes and the changing political context within the country and the government, Thai communities are today creating their own development path, negotiating partnerships with government and leading the way to improvement in their political and economic condition".

- UNESCAP Shelter for All (2000)

[1] UNDESA Agenda 21 Chapter 37 URL: http://www.un.org/esa/dsd/agenda21/res_agenda21_07.shtml [accessed 18.06.2011]
[2] WHO Urban Population Growth URL: http://www.who.int/gho/urban_health/situation_trends/urban_population_growth_text/en/index.html [accessed 12.07.2011]
[3] UNDESA Agenda 21 Chapter 37 URL: http://www.un.org/esa/dsd/agenda21/res_agenda21_07.shtml [accessed 06.07.2011]

Box 2: Kampung Improvement Programme, Indonesia

"The Kampung Improvement Programme in Surabaya provides a low-cost, innovative and sustainable method of transforming high-density urban informal settlements into green and clean neighbourhoods. The programme has reached over 1.2 million of the city's inhabitants and is being replicated in 500 other towns and cities throughout Indonesia. Its success has been achieved by mobilising people's own resources and by increasing their awareness of the importance of a clean and healthy living environment". It was the 1992 winner of the World Habitat Awards.

- World Habitat Awards, Previous Winners and Finalists

However, over all, the socio-economic inequalities within many urban areas in the developing world are still a point of contention and discussion. The right to adequate housing was recognised as a Human Right in the 1966 International Covenant on Economic, Social and Cultural Rights.[4] and while the overall proportion of the world's population living in slums has fallen in the last decade,[5] the population of slum dwellers in absolute numbers has continued to rise to in excess of 1 billion today[6] (Image 1). For example, slum formation increased at a rate of 4.5%, the same as urban growth overall between 2000 and 2005.[7] The Millennium Development Goal (MDG) 7 target of "improving the lives of at least 100 million slum dwellers by 2020" thus deals with just 10% of the slum population.

Furthermore, the original MDG7 target was established without a reference baseline figure and is set for the world as a whole rather than country or region specific (for most other MDGs the baseline is 1990). This has thus made it incredibly difficult for national governments to keep track of progress and set meaningful goals. A redefinition is being discussed.[8]

[4] Office of the United Nations Commissioner for Human Rights and UN-HABITAT (2009) "The Right to Adequate Housing", Factsheet 21 (Rev. 1)

[5] The Economist, Slum Populations: Slumdog Millions, March 24th 2010. URL: http://www.economist.com/node/15766578

[6] UN-HABITAT, Former Executive Director, Statements and Speeches, "Urban Housing Challenges and Opportunities in Developing Countries http://www.unhabitat.org/content.asp?cid=1345&catid=14&typeid=8&subMenuId=0 [accessed 03.07.2011]

[7] UN-HABITAT Quick Guide 1: Housing the Poor in African Cities – Urban Africa: Building with Untapped Potential, URL: http://www.unhabitat.org/pmss/listItemDetails.aspx?publicationID=3115 [accessed 03.07.2011]

[8] Millennium Development Goal Report 2010, UNDP, p.63; URL: http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf

Figure 1: Urban population living in slums, 2007
Source: UN-Habitat in The Economist, Slum Populations: Slumdog Millions, 24 March 2010.

In OECD countries the lack of provision of adequate housing is also a problem. In the UK, for example, there were 156,470 households registered as homeless in 2001/2002[9] and in the USA, 2.3 million to 3.5 million people are estimated to be homeless.[10] The UK's main housing charity, Shelter, thinks more needs to be done at an earlier stage to prevent people becoming homeless and that more affordable housing needs to be provided especially in areas where demand for social housing is outstripping supply.[11] Thus the issue of outpricing the poor from buying housing or land is a problem inherent in both developed and developing countries, exacerbated recently by the economic crisis.

Improving Human Settlement Management and Planning
In 1996, the Second UN Conference on Human Settlements (UNCHS) was held in Istanbul with the dual focus of "adequate shelter for all" and "sustainable cities".[12] As an outcome of the conference, the UN Member States committed to implement the Habitat Agenda which "aims to improve the quality of human settlements... in which economic development, social development and environmental development [are] interdependent and mutually reinforcing [towards] sustainable development".[13] From this, numerous initiatives were established such as the Global Urban Observatory (GUO),[14] the

[9] Office for National Statistics (2002) Households accepted as homeless by reason, 2001/2002: Regional Trends 38, URL: http://www.statistics.gov.uk/StatBase/ssdataset.asp?vlnk=7726&Pos=&ColRank=1&Rank=224 [accessed 12.07.2011]
[10] Homelessness in America (2011) URL: http://www.homelessnessinamerica.com/ [accessed 12.07.2011]
[11] Shelter (2009) Homelessness Prevention URL: http://england.shelter.org.uk/campaigns/housing_issues/tackling_homelessness/homelessness_prevention [accessed 12.07.2011]
[12] UN Conferences, Habitat II URL: http://www.un.org/Conferences/habitat/ [accessed 07.07.2011]
[13] UN-HABITAT (1996) The Habitat Agenda Goals and Principles, Commitments and Global Plan of Action URL: http://www.unhabitat.org/content.asp?ID=1176&catid=10&typeid=24&subMenuId=0 [accessed 03.07.2011]
[14] ICLEI's Link to the Global Observatory (2008) URL: http://www.iclei.org/index.php?id=1448 [accessed 02.07.2011]

Urban Management Programme (UMP),[15] the Global Strategy for Shelter to the Year 2000,[16] Local Agenda 21[17] and the Sustainable Cities Programme (SCP).[18]

Both bilateral and multilateral methods of financing housing and slum upgrading programmes exist with varying degrees of success. The World Bank and the Inter-American Development Bank (IDB) are two of the main multilateral bodies funding programmes in this area but both have recently been reducing the percentage of their portfolios spent on housing and slum programmes, and have begun to shift emphasis towards more large-scale policy related loans and broader urban development.[19]

Capacity-Building

UN-HABITAT has established various capacity building programmes over the last two decades such as helping Ethiopia identify and put together a clear action plan for a long term programme of support to improve the planning and managing of urban development[20] and an action plan to upgrade all informal settlements in Dar es Salaam, Tanzania by 2015.[21] UN-HABITAT is also responsible for coordinating the international community by supporting technical cooperation for the attainment of the Millennium Development Goal 7 Target 11 which is to make significant improvement in the lives of at least 100 million slum dwellers by 2015[22]. International financial institutions such as the Asian Development Bank and the Inter-American Development Bank,[23] and other international organisations such as ICLEI.[24] have taken on the role of building the national and local capacities in developing countries for sustainable settlements.

Integrated Planning, Infrastructure and Service Provision

Many UN Agencies have instigated the provision of services such as water, sanitation and solid waste management into their programmes and agendas, for example, the International Decade for Action Water for Life 2005-2015.[25] Other international organisations such as the World Bank, the Asian Development Bank and African Development Bank have also incorporated the importance of basic service provision in urban areas, alongside NGOs and Civil Society Organisations. Yet, despite these efforts progress on improving the standard provisions of water, sanitation and solid waste management have largely fallen short in most developing countries' urban areas especially within informal settlements. 35-50% lack access to clean safe drinking water, while 50-60% lack access to adequate sanitation, and between one third and one half of all solid waste generated is not collected.[26]

Efficient and inclusive urban mobility is essential for economic and social development since it enables citizens to access goods, services, jobs, markets, education opportunities and social contacts.

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[15] UN-HABITAT (1996) The Habitat Agenda Goals and Principles, Commitments and Global Plan of Action URL: http://www.unhabitat.org/content.asp?ID=1176&catid=10&typeid=24&subMenuId=0 [accessed 03.07.2011]

[16] UN General Assembly (20 Dec 1988) 83rd Plenary Meeting, "Global Strategy for Shelter to the Year 2000", URL: http://www.unhabitat.org/downloads/docs/1393_76192_other1.htm [accessed 02.07.2011]

[17] UN-HABITAT "Localising Agenda 21", URL: http://www.unhabitat.org/content.asp?typeid=19&catid=540&cid=5023 [accessed 01.07.2011]

[18] UN-HABITAT "Urban Challenge", URL: http://www.unhabitat.org/content.asp?typeid=19&catid=540&cid=5027&activeid=5025 [accessed 01.07.2011]

[19] International Housing Coalition (2008) Multilateral and Bilateral Funding of Housing and Slum Upgrading Development in Developing Countries, p.3-4. URL: www.intlhc.org/docs/shea.pdf

[20] UN-HABITAT, Urban Development and Management, Capacity Building for Sustainable Human Settlements – Ethiopia. URL: http://www.unhabitat.org/content.asp?cid=2317&catid=254&typeid=13&subMenuId=0

[21] UN-HABITAT, Urban Development and Management, Action Plan for Dar es Salam. URL: http://www.unhabitat.org/content.asp?cid=4611&catid=254&typeid=13&subMenuId=0

[22] UN-HABITAT, Urban Development and Management, Cities without Slums. URL: http://www.unhabitat.org/content.asp?cid=7019&catid=254&typeid=13&subMenuId=0

[23] International Housing Coalition (2008) Multilateral and Bilateral Funding of Housing and Slum Upgrading Development in Developing Countries, p.2. URL: http://www.intlhc.org/docs/shea.pdf

[24] ICLEI About. URL: http://www.iclei.org/index.php?id=about

[25] UN Water for Life URL: http://www.un.org/waterforlifedecade/

[26] UN-HABITAT Global Report on Human Settlements (2009) p.xxv, URL: http://www.unhabitat.org/downloads/docs/GRHS2009/GHRS.2009.pdf

One innovate example is the Sub-Saharan Transport Policy Program (SSATP) which is a unique partnership of 36 African countries, 8 regional economic communities, 3 African institutions – African Union (AU), The New Partnership for Africa's Development (NEPAD) and the UN Economic Commission for Africa (UNECA) – national and regional organisations as well as international development partners, all dedicated to the goal of ensuring that transport plays its full part in achieving the development objectives of Sub-Saharan Africa.[27] For example, in 2010, 27 Sub-Saharan Africa countries had a road fund, 19 had a road agency and 13 had both.[28]

Progress has been made in adopting the concept of sustainability within construction industries. In the UK, for example, the government has set sustainability standards for the construction and refurbishment of buildings on the government estate – although the success of this practice is debateable[29] - and in 2002, the UK's largest mixed use zero carbon community was built and occupied.[30] In Malaysia, the construction industry has also begun to move towards sustainable practices with the creation of focus groups concentrating on the integration of policies for waste minimisation, environmental management, and construction hazards.[31] In Indonesia, there is an annual competition to win US$2 million for sustainable construction projects.[32]

Disaster Risk Reduction

Disaster risk arises when hazards interact with physical, social, economic and environmental vulnerabilities.[33] In 2010, for example, natural disasters affected over 15 million people in urban centres in at least 25 countries.[34] In the same year, the UN International Strategy for Disaster Reduction (UNISDR) launched the 2010-2011 World Disaster Reduction Campaign "Making Cities Resilient" which addresses issues of local governance and urban risk[35] and bolstered the Hyogo Framework for Action of 2005 which was agreed by 168 Member States at the World Disaster Reduction Conference and is the first to explain, describe, and detail the work that is required from all different sectors and actors to reduce disaster losses.[36] In the 2010-2011 Mid-Term Review of the Hyogo Framework it was found that progress achieved in implementation is uneven across the world, reflecting broad economic and institutional differences among regions and countries (Map 1).[37]

Increased vulnerability can be generalised globally as increased populations in disaster risk areas,[38] poor urban planning and construction requirements.[39] The *reasons* for these increases, however, are more localised especially between developed and developing countries. For example, with cyclones, for every 'voluntary' resident in a high-risk coastal location (those seeking 'sun and surf' for instance) there are very many who have no alternative because their livelihoods are tied to jobs in oil refineries

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[27] World Bank (2011) Sub-Saharan Africa Transport Policy Program, URL: http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/AFRICAEXT/EXTAFRREGTOPTRA/EXTAFRSUBSAHTRA/0,,menuPK:1513942~pagePK:64168427~piPK:64168435~theSitePK:1513930,00.html

[28] World Bank and SSATP (2010) SSATP Annual Meeting, Kampala, Uganda, October 18-21, p.xi. URL: http://siteresources.worldbank.org/EXTAFRSUBSAHTRA/Resources/1513929-1297095557502/Annual-Meeting-2010-Proceedings.pdf

[29] National Audit Office (2007) Building for the Future: Sustainable construction and refurbishment on the government estate URL: http://www.nao.org.uk/publications/0607/sustainable_construction_and_r.aspx

[30] BioRegional – BedZed Briefing Sheet URL: http://www.bioregional.com/files/publications/BedZEDbriefingsheet.pdf

[31] Abidin, Nazirah and Jaapar, Aini (2008) Sustainable Concept Awareness in Malaysia Construction Practices, accessed online at URL: http://www.ljmu.ac.uk/BLT/BUE_Docs/Nazirah_Aini.pdf

[32] Sustainable Jakarta Convention URL: http://www.sjconvention.com/index.php/about/category/Jakarta

[33] UN International Strategy for Disaster Reduction (2005) 'Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters' *World Conference on Disaster Reduction*, www.unisdr.org [Accessed on 10-02-2007]

[34] ICLEI http://www.iclei.org/index/php?id=805

[35] UNISDR (2011) What is the "Making Cities Resilient"Campaign about? URL: http://www.unisdr.org/english/campaigns/campaign2010-2011/about/

[36] UNISDR Hyogo Framework For Action. URL: http://www.unisdr.org/we/coordinate/hfa

[37] UNISDR (2011) Hyogo Framework for Action 2005-2015 Building Resilience of Nations and Communities to Disasters Mid Term Review 2010-2011 URL: http://www.unisdr.org/files/18197_midterm.pdf

[38] Burton, I., Kates, R.W. and White, G.F., (1993) *The Environment as Hazard* (2nd Edition), The Guilford Press, New York, p.1

[39] Boissonnade, A. and Dong, W. (1993) 'Windstorm Model with Applications to Risk Management'. In Merriman, P.A. and Browitt, C.W.A. (eds.), *Natural Disasters: Protecting Vulnerable Communities.* Thomas Telford Services Ltd., London, p.331.

or export enclaves, in the service sector spun off from the tourist trade, on fishing boats or to employment on coastal farms and plantations.[40] This difference can be seen clearly between the United States (US) and Bangladesh. In the US there has been a high influx of people moving to the eastern coast despite knowing of its high vulnerability to cyclones.[41] While fatalities have declined due to improved precautionary and warning methods, the cost of structural damage has reached colossal levels[42] (e.g. Hurricane Katrina in 2008 is estimated to have cost US$125 billion). Conversely, in Bangladesh it is out of necessity that people move to the exposed coastal areas. To survive, many migrate to the coastal plains for paddy agriculture but as is a common theory throughout disaster risk reduction discourse, physical vulnerability to hazards occur where people lack the resources, awareness, knowledge, power or choices to mobilise defences.[43] In Bangladesh, the farmer has a very small margin of survival so that the family is particularly vulnerable to any minor fluctuations in climate .[44]

[40] Wisner, B., Blaikie, P., Cannon, T. and Davis, I. (2004) *At Risk: Natural Hazards, People's Vulnerability and Disasters* (2nd Edition), Routledge, London, p.243
[41] Boissonnade, A. and Dong, W. (1993) 'Windstorm Model with Applications to Risk Management'. In Merriman, P.A. and Browitt, C.W.A. (eds.), *Natural Disasters: Protecting Vulnerable Communities.* Thomas Telford Services Ltd., London, p.331.
[42] Burton, I., Kates, R.W. and White, G.F., (1993) *The Environment as Hazard* (2nd Edition), The Guilford Press, New York, p.1
[43] Aysan, Y. (1993) 'Vulnerability Assessment'. In Merriman, P.A., and Browitt C.W.A., (eds.), *Natural Disasters: Protecting Vulnerable Communities.* Thomas Telford Services Ltd., London, p.1-15
[44] Burton, I., Kates, R.W. and White, G.F., (1993) *The Environment as Hazard* (2nd Edition), The Guilford Press, New York, p.66.

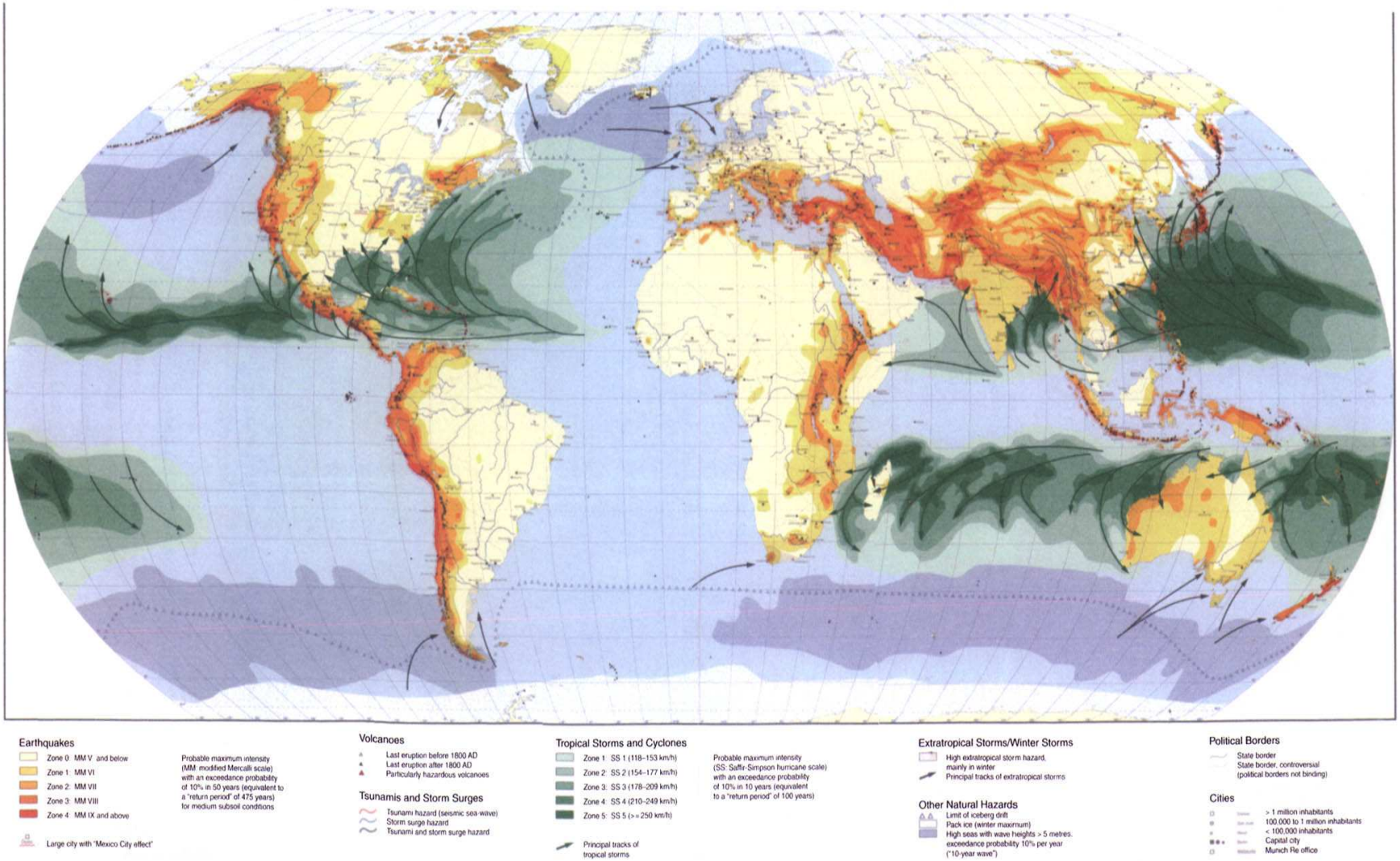

Figure 2: Disaster zoning worldwide

Source: http://helid.digicollection.org/en/d/Js2653e/6.1.html

Challenges and Conflicts

Poor management and planning

Between 1995 and 2005, the urban population of developing countries grew by an average of 1.2 million people per week, or around 165,000 people every day. By the middle of the 21st century, it is estimated that the urban population of these countries will more than double, increasing from 2.5 billion in 2009 to almost 5.2 billion in 2050.[1] Thus, the urban areas of the world are expected to absorb almost all the population growth expected over the next four decades while at the same time drawing in some of the rural population.[2] Yet, urban planning and management has been unable to cope with the growth thus far and so this future increase is likely to be significantly problematic.

Over much of the second half of the 20th century, policies to reduce urban poverty focused on investment in the rural sector in attempts to discourage migration to the cities and under the interpretation that urbanisation was primarily a product of rural-urban migration.[3] Despite recognition that in fact a large proportion of urban growth is due to natural population growth within the cities already, it was found in 2006 that many poverty reduction strategies were still failing to include urban poverty in their analysis or policy approaches.[4] One illustration of this comes from a survey conducted in Africa – in 2007, 74% of African governments were concerned that their countries were becoming urban too quickly, 78% had active policies to reduce migration to urban agglomerations and came to note that the central challenge facing African governments and urban managers is to learn how best to recognise and appreciate the efforts of the urban poor in the urban environment.[5]

UN-HABITAT has noted that "evidence from around the world suggests that contemporary urban planning has largely failed to address the challenges [with sustainable urban settlements]", perhaps because, as it also notices, "urban planning has changed very little in most countries since it emerged about 100 years ago". This has resulted in an inability to deal with more recent changes and challenges to urban planning and sustainable urban management such as environmental, political, civil society and institutional changes.[6] Within this issue, education in urban planning has been emphasised as important to improving urban management in the future. There are approximately 550 universities worldwide that offer urban planning degrees. About 60% of these are concentrated in 10 countries whereas the remaining 40% are located in 72 different countries. In total there are at least 13,000 academic staff in planning schools worldwide but while developing countries contain more than 80% of the world's population, they have less than half of the world's planning schools.[7] Furthermore, it is noted that curricula in many urban planning schools need to be updated particularly in the case of developing countries where it has not been revised to keep up with current challenges and issues, and now needs to engage in participatory planning, negotiation and communication, understanding the

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[1] WHO Urban Population Growth URL: http://www.who.int/gho/urban_health/situation_trends/urban_population_growth_text/en/index.html

[2] UNDESA Population Division (2010) World Urbanisation Prospects, The 2009 Revision, Highlights. URL: http://esa.un.org/unpd/wup/Documents/WUP2009_Highlights_Final.pdf

[3] Beall, Jo and Fox, Sean (2007) "Urban Poverty and Development in the 21st Century: Towards an Inclusive and Sustainable World", Oxfam Research Report p.7, URL: http://www.oxfam.org.uk/resources/policy/trade/downloads/research_urban_poverty.pdf [accessed 01.07.2011]

[4] Beall, Jo and Fox, Sean (2007) "Urban Poverty and Development in the 21st Century: Towards an Inclusive and Sustainable World", Oxfam Research Report p.7, URL: http://www.oxfam.org.uk/resources/policy/trade/downloads/research_urban_poverty.pdf [accessed 01.07.2011]

[5] UN-HABITAT Quick Guide 1: Housing the Poor in African Cities – Urban Africa: Building with Untapped Potential; URL: http://www.unhabitat.org/pmss/listItemDetails.aspx?publicationID=3115 [accessed 03.07.2011]

[6] UN-HABITAT Global Report on Human Settlements (2009) p.5-7, URL: http://www.unhabitat.org/downloads/docs/GRHS2009/GRHS.2009.pdf [accessed 30.06.2011]

[7] UN-HABITAT Global Report on Human Settlements (2009) p.xxvi, URL: http://www.unhabitat.org/downloads/docs/GRHS2009/GRHS.2009.pdf [accessed 30.06.2011]

implications of rapid urbanisation and urban informality, and bringing climate change into considerations.[8]

Overcoming informality

Another challenge facing urban management is the need to overcome the feeling that informality is both undesirable and illegal which has led to ineffective government responses such as elimination and neglect of the informal sector.[9][10] There is thus a need to recognise that conditions such as slums and informal settlements emerge when formal housing markets and government housing programmes fail to keep pace with urban growth.[11]

The informal sector in some developing countries constitutes over 80% of workers – as owners of informal-sector businesses, contributing family workers or employees without written contract or social security benefits.[12] For example, in Central Asia, the informal sector is responsible for between 33-59% of total economic output.[13] With the growing polarisation of occupational and income structures (and thus income inequality) caused by growth in the service sector of many economies and a decline in manufacturing, the informal sector has provided a security net for many of those unable to find official employment. The sector currently generates about 93% of new employment in developing countries.[14] It is also likely that the financial crisis has led to an increase in the informal sector due to job losses in the formal sector.[15] Yet, in many countries, informality is regarded as both undesirable and illegal, leading to ineffective government responses such as elimination and neglect.[16] Women are often over-represented within the informal sector.[17]

Furthermore, due to informal land rights people living in informal settlements are vulnerable to expropriation. More than 6.7 million people worldwide were evicted from their homes in 2001-2002 - most of them in urban areas. Across Africa, for example, 4 million people were evicted and millions more continue to live with the threat of eviction.[18] There are thus calls for an increase in the recognition and legitimacy of the informal sector.

Lack of basic services

Along with uncertain and illegal land tenure, low-income, high density settlements lack basic infrastructure and services such as drinking water, sanitation and energy.[19] The health risks associated with this are severe. Today, 90% of diarrhoeal diseases are linked to environmental pollution which is

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[8] UN-HABITAT Global Report on Human Settlements (2009) p.xxvi, URL: http://www.unhabitat.org/downloads/docs/GRHS2009/GRHS.2009.pdf [accessed 30.06.2011]

[9] UN-HABITAT Global Report on Human Settlements (2009) p. xxvi, URL: http://www.unhabitat.org/downloads/docs/GRHS2009/GRHS.2009.pdf [accessed 30.06.2011]

[10] The informal sector consists of small-scale, self-employed activities (with or without hired workers), typically at a low level of organization and technology, with the primary objective of generating employment and incomes. The activities are usually conducted without proper recognition from the authorities, and escape the attention of the administrative machinery responsible for enforcing laws and regulations. http://www.ilo.org/public/english/region/asro/bangkok/feature/inf_sect.htm

[11] Beall, Jo and Fox, Sean (2007) "Urban Poverty and Development in the 21st Century: Towards an Inclusive and Sustainable World", Oxfam Research Report p.8, URL: http://www.oxfam.org.uk/resources/policy/trade/downloads/research_urban_poverty.pdf [accessed 01.07.2011]

[12] Millennium Development Goal Report 2010, UNDP p. 24

[13] UN-HABITAT Global Report on Human Settlements (2009) p.xxvi, URL: http://www.unhabitat.org/downloads/docs/GRHS2009/GRHS.2009.pdf [accessed 30.06.2011]

[14] UN-HABITAT Global Report on Human Settlements (2009) p.xxvi, URL: http://www.unhabitat.org/downloads/docs/GRHS2009/GRHS.2009.pdf [accessed 30.06.2011]

[15] Millennium Development Goal Report 2010, UNDP, p.24

[16] UN-HABITAT Global Report on Human Settlements (2009) p.xxvi, URL: http://www.unhabitat.org/downloads/docs/GRHS2009/GRHS.2009.pdf [accessed 30.06.2011]

[17] Millennium Development Goal Report 2010, UNDP, p.23

[18] UN-HABITAT Global Report on Human Settlements (2009) p.5-7, URL: http://www.unhabitat.org/downloads/docs/GRHS2009/GRHS.2009.pdf [accessed 30.06.2011]

[19] UN-HABITAT, Former Executive Director, Statements and Speeches, "Urban Housing Challenges and Opportunities in Developing Countries http://www.unhabitat.org/content.asp?cid=1345&catid=14&typeid=8&subMenuId=0

one of the main killers in developing countries, especially for children under the age of five. The usual causes of tthese deaths are lack of safe drinking water, inadequate sanitation and lack of hygiene.[20] One of the main obstacles to increasing basic services for all has been the reluctance of city authorities to put in place sustainable pricing policies for these services that could ensure cost recovery. At the moment, the policies they are implementing are providing subsidies to the wealthier sections of society and therefore benefit from basic services such as water supply, while the poor – for whom fewer subsidies are in place – are rarely connected to municipal services and have to rely on the informal market for similar services.[21]

Energy provision, in urban areas especially, is another issue. Many residents of slums or illegal and informal settlements rely on unsustainable sources of energy such as charcoal and firewood for cooking and heating their homes, which is not only environmentally unsustainable and unreliable, but can have severe health consequences – one of the biggest killers amongst the poor in developing countries are respiratory diseases and lung cancer caused by indoor air pollution.[22] The WHO has estimated that 52% of the world's population cooks and heats their homes with solid fuels and 2.4 million of the poorest rely on biomass which can exceed the ambient air pollution standards by a factor of 2 to 60, and in many cases the smoke can be equivalent of smoking two packets of cigarettes each day.[23] In order to halve the number of people without access to clean fuels by 2015, 485,000 people would need to gain access every day for the next 10 years which could cost US$13 billion per year by supplying them with liquid petroleum gas. However, the payback rate would be US$91 billion per year.[24]

Commodification of housing

While market forces and real estate play a role in the contrasts between rich and poor in urban areas, it is also in part explained by prioritising commercial imperatives above social needs and planning the city for external investment rather than sensible planning.[25] Without legal titles or legally binding rent/lease agreements, the slums' inhabitants are vulnerable to expropriation and eviction.[26] These evictions usually coincide with a business opportunity to develop the land for other purposes or more expensive housing that is inaccessible to those evicted but much more profitable to new owners. There are numerous examples of this occurring recently including the eviction of slum dwellers for the 2010 Commonwealth Games in Delhi whereby a rough estimate of 200,000 people were displaced in different Games-related projects for construction of facilities and the beautification of the city. 18 people died during and in the aftermath of the forced eviction due to loss of livelihood and means to survive.[27] Other examples include the demolition of Mumbai's second largest slum for commercial development,[28] the demolition of slums in Rio de Janeiro to make way for new bus routes to ease

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[20] UN Water (2011) Sanitation: 5 Year Drive to June 2015 Factsheet 5 URL: http://www.sanitationdrive2015.org/factsheets/Sanitation-sustains-clean-environments.pdf

[21] UN-HABITAT Global Report on Human Settlements (2009) p. Xxv, URL: http://www.unhabitat.org/downloads/docs/GRHS2009/GRHS.2009.pdf [accessed 30.06.2011]

[22] WHO Indoor Air Pollution Publication, Part I. URL: http://www.who.int/indoorair/publications/fflsection1.pdf

[23] WHP & UNEP Health and Environment Linkages Initiative (HELI) (2011) URL: www.who.int/heli/risks/indoorair/indoorair/en/index.html

[24] WHO Indoor Air Pollution Publication, Part I. URL: http://www.who.int/indoorair/publications/fflsection1.pdf

[25] UN-HABITAT Global Report on Human Settlements (2009) p.xxii, URL: http://www.unhabitat.org/downloads/docs/GRHS2009/GRHS.2009.pdf [accessed 30.06.2011]

[26] Beall, Jo and Fox, Sean (2007) "Urban Poverty and Development in the 21st Century: Towards an Inclusive and Sustainable World", Oxfam Research Report p.8, URL: http://www.oxfam.org.uk/resources/policy/trade/downloads/research_urban_poverty.pdf [accessed 01.07.2011]

[27] Times of India, "Displaced by Games, Thousands still languishing", 7th Feb 2011. URL: http://timesofindia.indiatimes.com/city/delhi/Displaced-by-Games-thousands-still-languishing/articleshow/7447386.cms

[28] Guardian, 11th March 2011, http://www.guardian.co.uk/global-development/poverty-matters/2011/mar/11/mumbai-slums-developers-profits-residents

congestion during the World Cup,[29] and the eviction of one third of a million people from Africa's second largest slum in Nairobi to clear land reserved for roads in 2004.[30]
Slum upgrading is a previously successful response to issues with informal settlements.[31] In the latter example about Nairobi above, for example, progress has been made – in 2004, the residents were being evicted with little thought whereas in 2009 the plan changed to slum redevelopment by re-housing the residents of the slum in purpose built apartments for a small monthly rent with UN backing.[32] Slum redevelopment in this way reduces the risk of eviction and expropriation, and the risk of housing being further commodified and becoming increasingly inaccessible to the urban poor. This is not a problem that only affects developing countries. In the UK, for example, the high prices of mortgages and rents, exacerbated by the financial crisis, have rendered many families homeless and supply of housing for homeless or struggling families is outstripped by demand with 1.8 million households waiting on the Housing Register.[33]

Only 8 donor countries have been identified which provide significant funding to housing projects. The US was previously the largest bilateral donor but has recently reduced the amount spent on housing assistance. USAID programmes are now much smaller as well. The UK's Department for International Development (DFID) has also reduced its spending in this area and only tends to support housing assistance if it is an ancillary aspect of a larger project such as disaster reconstruction. Development agencies in Sweden and Germany have been through a similar process, whilst Spain provides significant housing assistance funding support in Latin and Central America.[34] As a percentage of Overseas Development Assistance (ODA), bilateral aid declined at the beginning of the last decade, while there was a slight increase in multilateral aid but nothing incredibly significant (Table 1).

Table 1. Percentage of ODA spent on housing from bilateral and multilateral sources

Institution	1995	1996	1997	1998	1999	2000	2001	2002	2003
Multilateral	0.001	0.177	0. 233	0.072	0.023	0.015	1.254	0.314	0.253
Bilateral	0.247	0.147	0.508	0.461	0.344	0.160	0.168	0.180	0.164

Source: International Housing Coalition, Multilateral and Bilateral Funding of Housing and Slum Upgrading Development in Developing Countries (2008:7)

Transport

Current trends suggest that few cities in developing countries will be able to afford the investment required for transport infrastructure and services to satisfy either present or future mobility demands. At present, the majority of the investment in transport infrastructure caters to the needs of the users of private motor vehicles, who are still a minority in most cities.[35] For Africa, specifically, the majority of traffic constitutes that in the informal sector and has led to chronic traffic congestion, extremely high levels of local pollution and poor levels of service for public transport compounded by inadequate infrastructure.[36] UN-HABITAT has found that city managers in Africa are frequently constrained by their capacity to design and implement effective sustainable transportation planning and policy especially due to: a lack of reliable data on levels and trends in motorisation and

[29] Reuters, 10th May 2011, http://www.reuters.com/article/2011/05/11/us-brazil-worldcup-slums-idUSTRE74A09720110511
[30] Guardian, 20th April 2004, http://www.guardian.co.uk/world/2004/apr/20/kenya.jeevanvasagar
[31] Beall, Jo and Fox, Sean (2007) "Urban Poverty and Development in the 21st Century: Towards an Inclusive and Sustainable World", Oxfam Research Report p.12, URL: http://www.oxfam.org.uk/resources/policy/trade/downloads/research_urban_poverty.pdf [accessed 01.07.2011]
[32] BBC News, 16th September 2009, http://news.bbc.co.uk/1/hi/world/africa/8258417.stm
[33] Shelter (2009) Homelessness Prevention URL: http://england.shelter.org.uk/campaigns/housing_issues/tackling_homelessness/homelessness_prevention [accessed 12.07.2011]
[34] International Housing Coalition (2008) Multilateral and Bilateral Funding of Housing and Slum Upgrading Development in Developing Countries, p.6-7. URL: www.intlhc.org/docs/shea.pdf
[35] UN-HABITAT (2010) A New Perspective: Sustainable Mobility in African Cities, p.5
[36] UN-HABITAT (2010) A New Perspective: Sustainable Mobility in African Cities, p.5

greenhouse gas emissions, limited financial resources and planning expertise, inadequate institutional frameworks and limited experience at local government level, lack of political engagement in favour of sustainable urban transport, lack of coordination in policy development, inadequate learning and scaling up from existing projects and weak capacity or absence for monitoring and evaluating of existing practices.[37] The emphasis on motorized networks is seen to be partly to do with the fact that walking is associated with poverty and so is often neglected in the designing of new cities or transport infrastructure, whereas having private motorised transport is seen as a wealthy luxury and something to aim towards thus cities have tended to be designed with this in mind.[38] Less than 20% of urban residents in developing countries own and use a private car.[39]

Way Forward

UN-HABITAT's Global Report on Human Settlements in 2009 argues that future urban planning must take place within an understanding of the factors shaping 21st century cities. These include the environmental challenges of climate change that will exacerbate many of the natural disasters currently affecting cities along with other impacts, and cities' excessive dependence on fossil fuel-powered cars; the demographic challenges of rapid urbanisation, rapid growth of small and medium sized towns and an expanding youth population in developing nations. In developed nations, there are challenges of shrinking cities, ageing and the increasing multicultural composition of cities; the economic challenges of uncertain future growth and fundamental doubts about market-led approaches that the current global financial crisis have engendered, as well as increasing informality in urban activities; increasing socio-spatial challenges, especially social and spatial inequalities, urban sprawl and unplanned peri-urbanisation; and the challenges and opportunities of increasing democratisation of decision-making as well as increasing awareness of social and economic rights among ordinary people.[40]

In particular, urban planning needs to be institutionally located in a way that allows it to play a role in creating urban investment and livelihood opportunities through responsive and collaborative processes as well as coordination of the spatial dimensions of public-sector policies and investment.[41] Experience suggests that countries where provincial and local authorities are the 'closest allies' of the central government in terms of democratic participation, urban planning and decision-making, are also the most economically and politically successful. A decentralised administration can play a catalyst role in sustainable development.[42]

Empowering interventions that target capacity development and skill transfer of individuals and community groups – as well as meaningful negotiations with institutions such as municipal governments, which can affect slum dwellers' lives – appear to be the most promising strategies to improve the slum dwellers' asset bases and health. NGOs, training institutions and international development partners are best placed to facilitate relationships between individuals, community groups, and vertical relationships with more powerful institutions that affect the slum dwellers' lives.[43]

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[37] UN-HABITAT (2010) A New Perspective: Sustainable Mobility in African Cities, p.10
[38] UN-HABITAT (2010) A New Perspective: Sustainable Mobility in African Cities, p.13
[39] UN-HABITAT (2010) A New Perspective: Sustainable Mobility in African Cities, p.10
[40] UN-HABITAT Global Report on Human Settlements (2009) p. xxv, URL: http://www.unhabitat.org/downloads/docs/GRHS2009/GRHS.2009.pdf [accessed 30.06.2011]
[41] UN-HABITAT Global Report on Human Settlements (2009) p. xxvi, URL: http://www.unhabitat.org/downloads/docs/GRHS2009/GRHS.2009.pdf [accessed 30.06.2011]
[42] UN-HABITAT (2003) United Nations Advisory Committee of Local Authorities (UNACLA), "The AGRED inaugural meeting", URL: http://ww2.unhabitat.org/unacla/agred.asp
[43] Sheuya: Improving the Health and Lives of People Living in Slums (2008) p.298 URL: http://0-onlinelibrary.wiley.com.emu.londonmet.ac.uk/doi/10.1196/annals.1425.003/pdf [accessed 06.07.2011]

As the urban populations continue to grow and focus shifts from a rural emphasis to an urban emphasis, it is imperative that the remaining rural population is not left behind, and that the current emphasis in Agenda 21 on ensuring the provision of basic services and adequate settlements in rural locations must continue and not be reduced.[44] However, simultaneously, the problems associated with urban areas must also receive increased funding and attention as they escalate.[45]

[44] Sheng, (2002) Poverty Alleviation Through Rural-Urban Linkages: Policy Implications, Economic and Social Commission for Asia and the Pacific, URL: http://www.unescap.org/pdd/prs/ProjectActivities/Ongoing/Rural-Urban%20Linkages/Rural-Urban%20Linkages-policyimp.pdf

[45] Beall, Jo and Fox, Sean (2007) "Urban Poverty and Development in the 21st Century: Towards an Inclusive and Sustainable World", Oxfam Research Report URL: http://www.oxfam.org.uk/resources/policy/trade/downloads/research_urban_poverty.pdf

Chapter 8: Integrating Environment & Development in Decision-Making

Introduction

The successful implementation of the multiple cross-cutting policies and targets outlined in Agenda 21 are each dependent upon the integration of environment and development in decision-making, also known as mainstreaming. The environment is inherently linked to sustainable development, with billions of people directly dependent upon natural assets such as rivers and oceans, forests and fertile lands for both sustenance and employment.[1] Yet institutions and decision-making processes have often treated the two separately, failing to recognise the potential socio-economic gains to be achieved from environmentally orientated policies. As a consequence, international environmental efforts have tended to be reactionary, primarily focusing on how to safeguard against the negative impacts of issues such as climate change, rather than pre-emptively looking at ways to address both of these heavily interdependent policy areas. [2]

Agenda 21 sought to promote a new ethos whereby sustainability represents the context in which all political and economic decisions are framed. This challenged the prevailing orthodoxy at the time - and which still persists - that perceives economic imperatives to be the dominant priority for policy-making. Chapter 8 recognised the importance of national policies and planning for integrating environment and development, as well as the necessity of legal and regulatory frameworks. It also highlighted the importance of market-based mechanisms and economic instruments for mainstreaming environment into development processes, as well as the need for frameworks to properly account for environmental capital and value. As such, Chapter 8 focuses on four broad programme areas:

- Integrating environment and development at the policy, planning and management levels;
- Providing an effective legal and regulatory framework;
- Making effective use of economic instruments and market and other incentives;
- Establishing systems for integrated environmental and economic accounting.

Implementation

Integrating environment and development at the policy, planning and management levels

National Sustainable Development Strategies (NSDSs)

Chapter 8 calls for the integration of economic, social and environmental considerations in decision-making at all levels and in all ministries. To advance this objective, many countries have developed and sought to implement National Sustainable Development Strategies (NSDSs). The 1997 programme for the Further Implementation of Agenda 21 aimed for all countries to have an individual NSDS in place by 2002, however by this stage only 85 had achieved this goal, with the nature and effectiveness of these initiatives varying greatly from nation to nation.[3] As Figure 1 displays, by 2010 the number of implemented NSDSs had risen to 106, with a further 10 being

[1] Millennium Ecosystem assessment, 2005.
[2] challenges of environmental mainstreaming - IIED 2009, p.16
[3] Secretary General Agenda 21 Review 2002, p.33

developed.[4] The United States, however, remains a notable absentee from this list, being the only OECD nation yet to implement an NSDS other than Turkey.

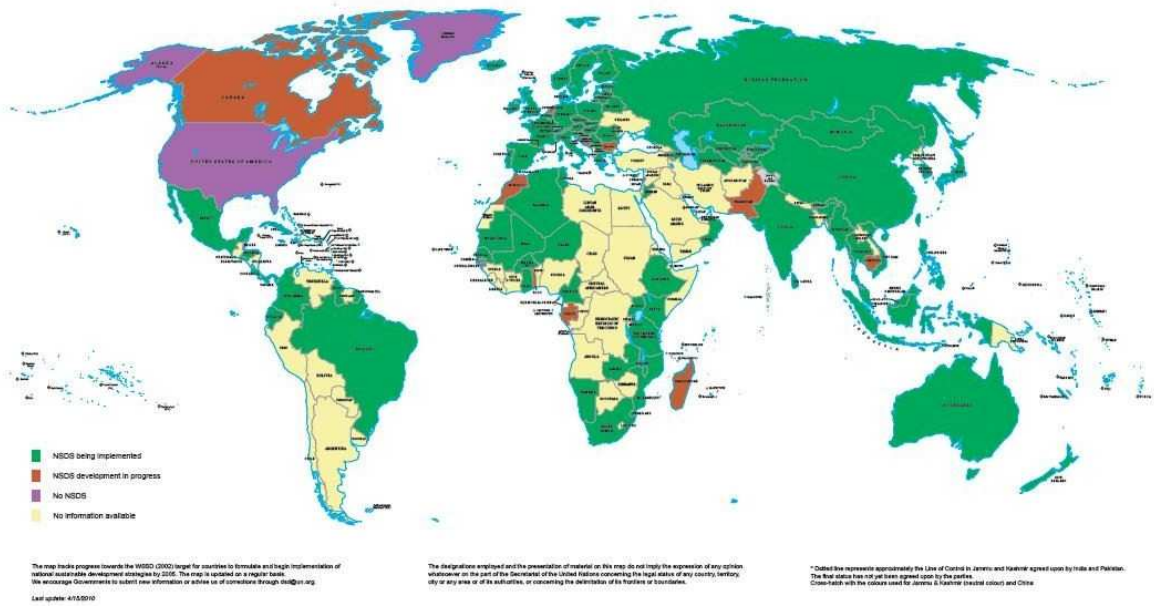

Figure 1: National sustainable development strategies: the global picture 2010
Source: http://www.un.org/esa/dsd/dsd_aofw_nsds/nsds_pdfs/NSDS_map.pdf)

Agenda 21 emphasised that NSDSs should not be rigid or standardised but rather specifically formulated and continually modified according to national needs, priorities and resources. Today, there remains a strong international consensus that successful NSDS must comprise of 'a set of coordinated mechanisms and processes that, together, offer an integrated and participatory system to develop visions, goals and targets for sustainable development, and to coordinate implementation and review'.[5] In practice, however, most nations are still only at the early stages implementing strategies which fit this description, with the likes of the UK, Canada and the EU in the North, along with El Salvador and the Philippines in the South able to be described as having well coordinated and iterative NSDSs.[6] What's more, in many of the world's poorest nations NSDSs have played a only a peripheral role, with efforts instead focusing on Poverty Reduction Strategy Papers (PRSPs), conservation programmes, environmental action plans, strategies related to the Rio conventions (biodiversity, climate, desertification), and newer MDG-related initiatives.[7]

During the 1990s, PRSPs in particular unequivocally failed to 'sufficiently address the environment's contribution to poverty reduction'.[8] The last decade has therefore seen several noteworthy attempts to shift the focus of PRSPs away from economic liberalisation to policy strategies that genuinely incorporate sustainability. In Indonesia, for example, Integrated Assessment and Planning (IAP) - a 2003 UNEP Economic Trade Branch (ETB) initiative aiming to enhance environmental mainstreaming in the context of increasing trade and poverty reduction

[4] http://www.un.org/esa/dsd/dsd_aofw_nsds/nsds_pdfs/NSDS_map.pdf
[5] http://www.environmental-mainstreaming.org/documents/EM%20Profile%20No%20%208%20-%20NSDS%20(5%20Oct%2009).pdf
[6] http://www.environmental-mainstreaming.org/documents/EM%20Profile%20No%20%208%20-%20NSDS%20(5%20Oct%2009).pdf; http://www.iisd.org/pdf/2004/measure_nat_strategies_sd.pdf, p.xi
[7] http://www.environmental-mainstreaming.org/documents/EM%20Profile%20No%20%208%20-%20NSDS%20(5%20Oct%2009).pdf
[8] Guidance Note: Mainstreaming Poverty-Environment Linkages into National Development Planning, UNEP-UNDP Poverty-Environment Initiative, p.3.

- was applied to its 2005-2015 PRSP, resulting in the implementation of various environment-oriented development projects.[9] Nevertheless, PRSPs remain an inadequate alternative for the far-reaching and integrated NSDS Agenda 21 advocated.

The role of UN agencies

Within the UN system, various bodies exist to assist with the implementation of NSDS. With national teams in 135 developing countries, UNDP continues to play a major role in the institutional capacity building necessary to integrate environment into development strategies.[10] As mandated by Agenda 21, UNEP also remains a primary source of information and expertise, having provided policy, legal and technical advisory services for environmental mainstreaming processes to virtually all UN member states since the Rio Summit.[11] In addition**,** the United Nations Development Assistance Framework (UNDAF) undertakes Common Country Assessments (CCA) to attempt to bring greater coherence to UN programmes of assistance at the national level.[12] These efforts have contributed to improved environmental governance in the likes of Armenia, Ghana and the Philippines, however they remain primarily occupied with improving UN support for PRSPs and MDG strategies, rather than improving the effectiveness of NSDSs per se.[13]

The UNDP-UNEP Poverty-Environment Initiative (PEI), however, has been specifically created to facilitate environmental mainstreaming. Launched in 2005 but significantly scaled up in 2007, PEI assists with preliminary national assessments in developing nations, subsequently providing both technical and financial support to government partners to undertake with mainstreaming processes.[14] Like IAP initiatives, this has often occurred through augmenting poverty-environment linkages into existing policy processes such as PRSPs or MDG programmes. Early analysis of their effectiveness has highlighted that its efficiency is highly variable from one country to the next.[15] Their ability to positively influence national planning systems has been praised, yet they have struggled to impact upon budget allocation, thereby significantly limiting their effectiveness[16]

The environmental mainstreaming of development agencies and initiatives

Since 1992 Multilateral Development Banks (MDBs) have also attempted to integrate environment and sustainable development into the assistance programs they deliver to specifically help client countries mainstream these factors into their development process. In 2001, the World Bank endorsed a new environment strategy specifically for this purpose and is currently developing an updated, further reaching, version based on its experiences over the last decade.[17] Whilst the Bank describes its direct contribution to specific country outcomes as hard to ascertain, it cites examples such as improved cross-sectoral water management in China as an

[9] http://www.unep.ch/etb/areas/inteAsse.php
[10] http://www.undp.org/environment/index.shtml.
[11] Secretary General Agenda 21 Review 2002, p.33
[12] http://www.undg.org/index.cfm?P=1532
[13] http://www.unep.org/dec/docs/8770-Review_of_the_Role_and_Quality_of_UNDAFs.pdf; pp.71,74,84,100.
[14] Guidance Note: Mainstreaming Poverty-Environment Linkages into National Development Planning, UNEP-UNDP Poverty-Environment Initiative, p.4
[15] Evaluation of the UNDP-UNEP Poverty-Environment Initiative (PEI), Partnership with Norway 2004-2008, Report to Norwegian Ministry of Foreign Affairs, by Steve Bass and Yves Renard, International Institute for Environment and Development (IIED), 2009, p.3.
[16] Evaluation of the UNDP-UNEP Poverty-Environment Initiative (PEI), Partnership with Norway 2004-2008, Report to Norwegian Ministry of Foreign Affairs, by Steve Bass and Yves Renard, International Institute for Environment and Development (IIED), 2009, pp.2-4.
[17] http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/ENVIRONMENT/0,,contentMDK:20123152~menuPK:281634~pagePK:210058~piPK:210062~theSitePK:244381,00.html;
http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/ENVIRONMENT/EXTENVSTRATEGY/0,,menuPK:6975719~pagePK:149018~piPK:149093~theSitePK:6975693,00.html

indication that its strategy is having a positive impact, primarily providing technical and capacity building experience due to its expertise in integrated water resource management (IWRM).[18] Nonetheless an independent evaluation of the Bank's environment strategy has emphasised a lack of coherent integration of environmental goals into its country strategies and investments, as well as the continued absence of effective mechanisms to assess the environmental aspects and outcomes of the projects it supports.[19] On a similar theme, there are strong indications that most bilateral donors are mainstreaming the environment across sectors, however independent analysis of the impact this has had on at the national level remains limited.[20]

MEAs and the transatlantic divide

Broadly speaking, since 1992 there has been a clear divergence between EU and US approaches on environment. In the former, the state has generally retained an active role, however strong regulatory intervention in the latter has been increasingly challenged.[21] What's more, whilst the EU has increasingly favored multilateralism - both within Europe and internationally – the US has remained resolutely unilateral. This has been clearly displayed by US's tendency to opt out of several key Multilateral Environmental Agreements (MEAs), with its failure to ratify the 1992 Convention on Biological Diversity (CBD) and the Kyoto Protocol two of the most prominent examples.[22]

At the national level

Several governments have institutionalised dialogue mechanisms through the creation of National Councils of Sustainable Development and various other stakeholder steering committees.[23] In the UK for example, the 1999 NSDS saw the establishment of an independent Sustainable Development Commission (SDC) comprised of representatives from academic, scientific, business and NGO backgrounds, performing an official watchdog function, scrutinising the government's progress on implementing its sustainable development strategy.[24] In 2005, as a result of a SDC review which concluded that the UK had only made 'patchy' progress in meeting its NSDS goals, the government engaged in a wide process of stakeholder consultation to draft a new NSDS. This was ratified as the 'Securing the Future' strategy, placing, amongst other issues, a stronger emphasis on international dimensions and has since led to significant developments such as the 2008 Climate Change Act that sets legally binding CO2 reduction targets.[25] Both in the UK and elsewhere, however, the influence these institutions have on the majority of policy making processes remains insufficient, with key stakeholders being systematically excluded, ignored or simply not mandated to influence decisions not considered conventionally 'environmental' in nature. The current UK government's decision to terminate the SDC for budgetary reasons aptly displays the magnitude of the environmental mainstreaming challenge, even in those countries considered to be at a relatively advanced stage of the process.

Many African states have also created National Councils for Sustainable Development Councils (NCSDs) in line with UNCED recommendations. In keeping with its UNCED and WSSD mandate to promote the integration of environment and sustainability concerns in both regional and sub-regional development programmes, in 2005 the UN Economic Commission for Africa

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[18] http://siteresources.worldbank.org/EXTENVSTRATEGY/Resources/6975692-1289855310673/20101209-Mainstreaming-Environmental-Sustainability.pdf, p.15

[19] http://www.brettonwoodsproject.org/art-562447

[20] http://siteresources.worldbank.org/CFPEXT/Resources/Aid_Architecture_for_the_Environment.pdf, pp. i-ii

[21] http://www.ashgate.com/pdf/SamplePages/Transatlantic_Environment_and_Energy_Politics_Ch1.pdf, p.7

[22] http://www.ashgate.com/pdf/SamplePages/Transatlantic_Environment_and_Energy_Politics_Ch1.pdf, p.7.

[23] Secretary General Agenda 21 Review 2002, p.36

[24] http://www.sd-commission.org.uk/pages/our-role.html

[25] Profiles of Tools and Tactics for Environmental Mainstreaming: No. 8 National Sustainable Development Strategy (NSDS), IIED, 2009, p.6

(ECA) undertook a review of the continent's NCSDs, revealing that whilst most countries possessed NCSD in some shape or form, the vast majority fall short in effectively addressing the three dimensions of sustainable development (environmental, economic and social) in a 'holistic and integrated manner'.[26] For example, the use of Strategic Environmental Assessment (SEA) to improve integration at the level of policies, programmes and plans were apparent only in the case of Ghana and Benin.[27]

Another source of nation specific guidance for environmental mainstreaming is supplied by the Global Environment Facility (GEF) through its Country Support Programme. Working closely with UNDP, GEF's provides finance for its 182 member countries to assist with their transitions to more sustainable forms of governance. The administration of these funds are channelled to each country through specific Focal Points, tasked with coordinating, integrating, and promoting consultation on the programmes they financing vis-à-vis ensuring that 'GEF-funded activities are country-driven and based on national priorities'.[28] Nonetheless, GEF has received much criticism for its top down governance structures and a tendency to disregard the negative social impacts its programmes.[29] In 2005 GEF adopted a new Resource Allocation Framework (RAF) in an attempt to improve its partnership and transparency credentials. However subsequent analysis of the RAF in practice has revealed that through severely limiting the role of civil society organisations in the execution of its projects, it has actually had negative impacts on both equitability and inclusiveness.[30]

Providing an effective legal and regulatory framework

Environmental Impact Assessments

At the national level, Environmental Impact Assessments (EIA) remain a key legal device for 'integrating social and environmental costs into economic activities'.[31] Through requiring policy makers to account for environmental values and justify their decisions against these criteria, there has been significant movement away from the treatment of the environment as a 'free' resource in many countries.[32] Within the European Union, EIA legislation has been significantly strengthened since Agenda 21, most notably in response to the 1998 UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention). As an unprecedented legal mechanism for increasing dialogue between policy makers and stakeholders on matters concerning the environment, the Convention has been ratified by 44 primarily European countries and in 2001 led to the creation of an EU SEA Directive.[33] As a result, legally, member states must engage in processes of stakeholder consultation regarding proposed development projects, as well as explicitly identify their potential environmental effects and how these will be mitigated. Nonetheless, especially outside Europe there are still major concerns that EIA are falling short of their full potential, with governments lacking the necessary skills, guidance or political will to see them do more than simply 'greenwash' decision making processes.[34]

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[26] National Councils for Sustainable Development in Africa: A review of Institutions and their Functioning, UNECA, 2005, p.xvii.
[27] National Councils for Sustainable Development in Africa: A review of Institutions and their Functioning, UNECA, 2005, pp.xiv-xv.
[28] http://www.gefcountrysupport.org/report_detail.cfm?projectId=175
[29] http://www.forestpeoples.org/sites/fpp/files/publication/2010/08/fppgefbriefingaug06eng.pdf, p.2
[30] Impact of the Global Environment Facility (GEF) Resource Allocation Framework (RAF) on Civil Society Organizations, FEU-US, 2009, p.vii
[31] Agenda 21, Section 1, Chapter 8
[32] Holder, J., (2004), Environmental Assessment: The Regulation of Decision Making, Oxford University Press, New York
[33] http://www.unece.org/env/pp/ratification.htm; http://ec.europa.eu/environment/eia/home.htm
[34] Jays, Jones, C., Slinn, P., Wood, C., (2007), Environmental Impact Assessment: Retrospect and Prospect Environmental Impact Assessment Review 27: 287-300

Legally binding national acts

To compliment environmental directives which exist at the regional and international levels, countries of all sizes and political dispositions have ratified legally-binding national bills, ranging from the aforementioned 2008 Climate Change Act in the UK, to legislation in place in the Federated States of Micronesia.[35] Under President Morales, Bolivia is planning to go one step further, currently making amendments to its constitution to enshrine the rights of nature.[36] This will in turn lead to the significant strengthening of its environmental laws in its attempts to cope with the effects of climate change and the depletion of its natural resources.

In India, the Supreme Court continues to play a leading role in the creation of and compliance with sustainability laws, having the power to expand existing constitutional provisions and take direct action against those damaging the environment for example.[37] This has led India's National Rural Employment Guarantee Act 2005 (NREGA), generating some '3.5 billion days of work reaching on average 30 million families per year' through strengthening rural natural resource management to address the causes of drought, deforestation and soil erosion, 'thus restoring the natural capital base on which rural livelihoods depend'.[38] This is not to say that the scheme has been without its problems, however, with the average annual wage being realised by the families being approximately two thirds less than what was originally envisaged in the Act.[39]

Extended Producer Responsibility (EPR) strategies have also been used as an effective legal approach to encouraging environmental mainstreaming, through incentivising manufactures to create more environmentally friendly products by forcing them to internalise the costs of their disposal or re-use. Successful initiatives include the EU's 2003 Waste Electrical and Electronic Equipment (WEEE) Directive, which despite delays in the transposition of its provisions into national laws, has directly contributed to a marked increase in the levels of recycling in this area across Europe over the past 3 years.[40]

Alternative measurements of growth

There has also been an emerging recognition of the limitations to GDP, with several national policy makers and NGOs proposing alternative devices to measure development. Bhutan is so far the only country to institutionalise a different measurement of growth, with its Gross National Happiness (GNH) index incorporating a range of factors to calculate progress including human and ecological health, education, wellbeing, and standard of living.[41] Nevertheless, the Commission on the Measurement of Economic Performance and Social Progress created by President Sarkozy of France in 2008 and chaired by economists Jean-Paul Fitoussi, Amartya Sen and Joseph Stiglitz, has sought to explore alternative indicators of progress to GDP and provide a common template for any interested country to adopt.[42]

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[35] http://www.sprep.org/att/IRC/eCOPIES/Countries/FSM/62.pdf

[36] http://www.guardian.co.uk/environment/2011/apr/10/bolivia-enshrines-natural-worlds-rights; http://www.iucn.org/about/union/secretariat/offices/usa/about_usa/un/?7395/UN-Prepares-to-Debate-Whether-Mother-Earth-Deserves-Human-Rights-Status

[37] Implications of Indian Supreme Court's Innovations for Environmental Jurisprudence, Geetanjoy Sahu, LEAD, 2008, p.4 http://www.lead-journal.org/content/08001.pdf

[38] UNEP, Green Economy Developing Country Success Stories

[39] http://www.empowerpoor.org/downloads/nreport.pdf, p.70

[40] WEEE Forum Annual Report 2010, p.9 http://www.weee-forum.org/system/files/various/2010_annual_report_final.pdf

[41] Green, Fair and Productive: How the 2012 Rio Conference can move the world towards Sustainability, Green Economy Coalition, 2010, p.4 (http://www.povertyenvironment.net/files/GEC_Rio2012_0510.pdf)

[42] http://www.stiglitz-sen-fitoussi.fr/en/index.htm

Making effective use of economic instruments and market and other incentives;

Ecotax

Ecological taxation has been brought in by numerous governments in attempts to decrease the financial viability of environmentally damaging economic practices. Finland (1990), Sweden (1990), Norway (1991) and Denmark (1992) have been frontrunners in launching specific taxes in attempts to curb emissions such as CO_2 from industrial processes.[43] These policies quickly yielded positive results, with Nitrous Oxide emissions in Sweden for example falling by a third within two years.[44] Furthermore, the use taxation rather than policies which insist upon the use of certain technologies to reduce emissions, directly promotes scientific innovation and green growth. Taxation on the use of fossil fuels for transport also continues to promote the use of less energy intensive or polluting alternatives, something which has become well established in the EU, but has also proved particularly effective in Brazil for instance, with high taxation on petroleum seeing a considerable proportion of its fuel for transportation coming from ethanol derived from sugar cane which uses up to 8 times less energy to produce.[45] Nonetheless the EU perhaps displays the limitations of environmental taxation, with the environmental levies as a percentage of overall taxation actually decreasing from 6.9% in 1995 to 6.4% in 2005.[46]

Incentive structures for renewable energy

Feed-in tariffs (FITs) are an economic mechanism that have been introduced in a number of countries to accelerate investment for technological innovation in the renewable energy sector. This involves governments offering long-term contracts to companies undertaking R&D and in renewable energy production and use. FITs have become the mainstay of many Northern countries, including most of Europe and North America. Ireland's Renewable Energy Feed-In Tariff (REFIT) initiative guarantees prices for all registered companies generating renewable power to attract 'sufficient confidence for investment finance and loan capital which may not otherwise be provided'.[47] This type of initiative is also becoming increasingly prevalent in developing countries, including, amongst several others, China, India and South Africa.[48] Nonetheless, the scale and scope of FITs in the South remains varied, and are still absent in Russia as well as most countries in Africa, Latin America and the Middle East. This is not to say that FITs are a panacea for all energy-related environmental dilemmas, however they remain an important tool for furthering the mainstreaming of sustainability within the energy sector.

Cap and Trade systems

Cap and Trade systems have emerged as prominent environmental policy tool for decision makers at all levels. These operating according to the establishment of an agreed emissions limit for a pollutant in a single year. This subsequently enables the distribution or sale of permits to produce the pollutant, facilitating the regulation of the overall output of said pollutant, thus making the original target easier to reach. Various forms of cap and trade system have been implemented at all levels of decision making since the 1992 Summit. These have varied greatly in both their scope and effectiveness. More successful efforts include the Acid Rain Program implemented by the US government in 1995, with phase one involving around 450 primarily coal-burning electricity utility plants being able to reduce their SO_2 emissions by almost 40 percent below their required level.[49] Far less successful, however, has been the European Union

[43] Andersen, M.S. (2004). Vikings and virtues—a decade of CO_2 taxation. *Climate Policy* 4: 13-24.
[44] http://www.oecd.org/document/25/0,3343,en_21571361_44315115_46354841_1_1_1_1,00.html
[45] http://www.bioenergytrade.org/downloads/coelhonovdec05.pdf, p.11
[46] http://www.eea.europa.eu/data-and-maps/indicators/en32-energy-taxes-1/en32, p.1
[47] International Trade and Climate Change: Economic, Legal and institutional Perspectives, World Bank (2008), p.111.
[48] http://www.earthscan.co.uk/Portals/0/pdfs/Mendonca_Jacobs_REW.pdf, p.108.
[49] http://www.epa.gov/airmarkets/progsregs/arp/basic.html

Greenhouse Gas Emission Trading Scheme (EU ETS), with its first phase unable to reduce the emissions of the parties involved.[50]

Establishing systems for integrated environmental and economic accounting.
Initially developed in 1993 (revised in 2001 and 2003) as a satellite framework to the UN system of National Accounts (SNA), a System of Integrated Environmental and Economic Accounting (SEEA) has been created to improve measurement of the inter-relationship between the economy and environment. Through enabling the quantification of environmental assets in monetary terms, this flexible data system enables integrated analysis at the national level using the SNA as a common data framework.[51] Policy makers are therefore able to calculate the value of the natural capital which their country possess and the economic costs of its depletion, as well as pricing the costs of emissions and other waste from production and consumption processes.[52] A collaborative effort by several global institutions[53] led to the publication of the 2003 Handbook of National Accounting for IEEA, providing a detailed framework for policy makers to calculate the contribution of the environment to the economy and vice-versa to enable subsequent processes of 'strategic planning and policy analysis to identify more sustainable development paths'.[54] These efforts were further bolstered by the establishment of the UN Committee of Experts on Environmental-Economic Accounting (UNCEEA) by the UN Statistical Commission in 2005, tasked with further elevating SEEA to an international statistical standard and advancing its implementation at the national level.[55]

By 2007, 72 countries had implemented or were planning to establish an environmental accounting system of some nature.[56] Of this figure, most are developed nations such as Australia, Canada and France, however some significant Southern examples can be seen in the likes of Namibia and the Philippines. Many nations are also standardising their water accounting practices according to environmental principles; a process that has been greatly assisted by the initiation of attempts in 2009 to create an international SEEA for this resource. Some countries have opted to adopt environmental accounting methods outside the 2003 SEA framework, including the Netherlands, which developed its National Accounting Matrix including Environmental Accounts (NAMEA), subsequently developing a 'consistent time series for oil, natural gas, and six types of environmental degradation (such as the greenhouse effect and acidification) based on emission flows'.[57] The success of NAMEA has resulted in the EU officially adopting this framework, and is providing finance for other member states to develop their own NAMEA systems.

Attempts to promote the cost-benefit analysis of environmental sustainability predate the UNCED but remain a highly useful tool for decision makers to integrate the environment into their national accounting systems.[58] In the last decade, these efforts have been greatly assisted by the extensive data provided from the Millennium Ecosystem Assessment (2005)[59], and the more recent The Economics of Ecosystems and Biodiversity (TEEB) study, an initiative attempting to

[50] http://www.openeurope.org.uk/research/etsp2.pdf, p.16.
[51] http://www.un.org/esa/sustdev/natlinfo/indicators/egmIndicators/EGM_SDI.pdf
[52] http://www.un.org/esa/sustdev/natlinfo/indicators/egmIndicators/EGM_SDI.pdf
[53] United Nations, European Commission, International Monetary Fund, Organisation for Economic Co-operation and Development, and World Bank
[54] Handbook of National Accounting: Integrated Environmental and Economic Accounting 2003, p.iii (http://unstats.un.org/unsd/envAccounting/seea2003.pdf)
[55] http://unstats.un.org/unsd/envaccounting/ceea/
[56] Environmental Accounting: Current Status and Options for SAIs, INTOSAI, 2010, p.16.
[57] Environmental Accounting: Current Status and Options for SAIs, INTOSAI, 2010, p.16.
[58] See Barbier E B, Markandya A, Pearce D W, 1990, "Environmental sustainability and cost - benefit analysis" *Environment and Planning A* **22**(9) 1259 – 1266; and Costanza et al. The value of the world's ecosystem services and natural capital. *Nature* 387:253-260 (1997).
[59] http://www.maweb.org/en/Index.aspx

draw attention to the global economic benefits of biodiversity through highlighting the growing costs of ecosystem degradation.[60] TEEB provides detailed guidance for decision makers to assist with the internalising of the environment as an economic resource. The use of these resources, coupled with greater efforts to engage and account for local, often rural and poor stakeholder groups in the planning and implementation stages of national IEEA efforts, could see them become an integral component of environmental governance in all countries.

Challenges and Conflicts

At the international level, a strong consensus exists regarding the need to integrate environment and sustainability into decision making processes. This is clearly demonstrated by the number of UN agencies mandated to assist with this transition as well as the depth of analysis and technical support they provide, despite the former not itself an adequate indicator of their effectiveness. Whilst the UN must still address the problem of system-wide coordination, the large number of countries that have developed NSDS has had a positive impact in this regard. However, there remain a number of challenges to achieving environmental mainstreaming:

Sharing best practices
The International Institute for Environment and Development (IIED) has observed that advice at this level can often be too theoretical and expert-driven.[61] What appears to be lacking in certain instances, therefore, are more effective vehicles for policy makers to share experiences of mainstreaming 'in the context of advocacy, analysis, planning, investment, management and monitoring', and sufficient emphasis on the benefits of linking institutions and replicating success stories.[62]

Weak legislative frameworks
Whilst there have been a number of new global agreements and protocols on the environment and sustainable development ratified since 1992, the creation or adaptation of the legal and institutional framework necessary to implement these conventions at the national level has been a difficult, expensive and time consuming process.[63] Most countries still lack the organisational or financial capacity to implement the reforms necessary for environmental mainstreaming. In those countries and regions that have implemented legal environmental instruments such as EU and its EIA directives, considerable progress has been made, but compliance is still not guaranteed, often due to ineffective monitoring and regulatory instruments. Current regulations in developed nations - those which make by far the greatest contribution to overall levels of environmental degradation - are not comprehensive enough to prevent the continuation of unsustainable business practices and stimulate green development in most sectors of the economy.

Exporting environmental damage
Most EIAs and other mainstreaming processes in developed countries consistently fail to factor in the unsustainable production processes of the many products these nations import and consume from regions with less stringent environmental controls. Therefore in the absence of universal standards on the sourcing and manufacture of commodities, Northern countries will continue to effectively export environmental degradation to the South.

[60] http://www.teebweb.org/AboutTEEB/Background/AimsObjectives/tabid/1040/Default.aspx
[61] http://www.environmental-mainstreaming.org/Environment%20Inside/Chapter%201/chapter1-1.html
[62] http://www.environmental-mainstreaming.org/Environment%20Inside/Chapter%201/chapter1-1.html
[63] Secretary General Agenda 21 Review 2002, p.34

Capacity challenges

International support is central for greater progress in environmental mainstreaming, yet its success is ultimately determined by capacity and political will at the national level. Several governments and stakeholders in developing nations have expressed opposition to the concept, perceiving it as another form of Northern-imposed aid conditionality.[64] Some indigenous groups for example have criticised GEF for excluding them during both the organisation and implementation phases of their initiatives, and failing to uphold their rights to land tenure.[65] Opposition to or a lack of progress in environmental mainstreaming will persist in the developing world if there are not sufficient economic incentives for the reforms necessary to improve environmental governance; the principal challenge to more sustainable decision making.

Economic-environmental tensions

In industrialised countries, there has been little progress in moving away from logic perceiving environmental protection and economic development as mutually exclusive, resulting in decision makers continuing to pursue unsustainable supply-driven economic policies rather than those which respond to genuine demand and environmental pressures.[66] The failure of the US to ratify the Kyoto Protocol, as well as Japan and Russia indicating that they intend to reject new emissions targets to be proposed upon its expiry in 2012, exhibits the firm grip unsustainable economic processes still have on Northern decision makers.[67]

Developing countries will remain reluctant to implement the costly and challenging reforms necessary for effective mainstreaming if policies in industrialised nations continue to themselves externalise the environment. The dominant development paradigm in all countries retains its focus on the achievement of economic growth - irrespective as to whether provisions such as EIA have been implemented - which is measured by indicators such as GDP which does not incorporate social or environmental factors.[68] Current norms of governance are thus incapable of fully internalising environmental costs, combating inequalities, or developing alternative economic models; therefore unless these change, unsustainable policies will remain the status quo. [69]

The limitations of cap and trade

Whilst cap and trade can be used as a way of reducing global emissions, several of the examples in which it has been implemented so far have exhibited numerous flaws and challenges. The clearest example of this is perhaps the first phase of the EU ETS from 2005 to 2007, having set an unrealistic emissions cap and subsequently distributing more permits to pollute than there is pollution, most of which being given away for free rather than being properly auctioned.[70] This ultimately led to a collapse in the price of carbon, therefore creating no incentive to reduce emissions, seeing the UK firms covered by the scheme, for example, actually increasing their pollution by 3.6% in the first year.[71] At the macro level, cap and Trade systems will continue to be yield inadequate results if permits are poorly allocated and able to be gained through unregulated offsetting processes. Yet at the micro level, these systems fail to address the real drivers of environmental degradation.

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[64] challenges of environmental mainstreaming - IIED 2009, (check page)
[65] Indigenous Peoples and the GEF, Thomas Griffiths, 2005, p.1
[66] http://www.environmental-mainstreaming.org/Environment%20Inside/Chapter%201/chapter1-1.html
[67] http://unfccc.int/kyoto_protocol/items/2830.php; http://www.bloomberg.com/news/2011-04-08/no-nation-fundamentally-opposes-extending-kyoto-treaty-un-s-figueres-says.html
[68] challenges of environmental mainstreaming - IIED 2009, (pp.34-35)
[69] challenges of environmental mainstreaming - IIED 2009, (pp.34-35)
[70] http://www.openeurope.org.uk/research/etsp2.pdf, p.45.
[71] http://www.openeurope.org.uk/research/etsp2.pdf, p.16.

Integrated Environment and Economic Accounting

Despite progress at the global level in the creation of an environment conducive to the implementation of more sustainable accounting processes, most countries still do not possess functioning IEEA systems. In China, where rapid economic growth has had significant environmental and human health costs, the government has investigated using the SEEA framework to calculate its 'Green GDP' to garner a more accurate account of the nation's development.[72] Yet this project is remains far from complete, emphasising how the implementation of IEEA at the national level is both a difficult and slow process. Countries with the most effective systems of this nature, such as Norway's National Material Accounting process have taken decades to become fully operational.[73]

The implementation of IEEA systems therefore remains a widespread challenge. They have indeed been applied in several developed nations, however they do not yet exert the influence on decision making processes to the extent called for by Agenda 21. This is largely because of it remains a low priority for finance ministries, with there being little public awareness and therefore pressure for strengthening these measures. In developing countries, IEEA initiatives remain absent or uninfluential due to a lack of institutional capacity or political will to bring them to the fore in the face of seemingly more immediate priorities such as education and healthcare for instance. Whilst significant progress has been made by UN agencies in providing the statistical support necessary for countries to adopt IEEA practices, developing countries still lack sufficient examples of successfully implemented IEEA programmes in nations with similar political, economic and environmental dispositions to encourage decision makers to make them more of a priority.

Way Forward

This shift must occur at the national level, within the policy making organs of central and local government, as well as at the international level, in which multilateral institutions alter their priorities or focus to promote the integration of the environment and sustainable development more effectively. This will rely upon the establishment of effective national legal and regulatory frameworks to institutionalise mechanisms that increase dialogue between decision makers and key stakeholder groups, and also create an environment that rewards stakeholders for successfully integrating sustainability into their decision making structures.

Similarly, Rio+20 could provide an opportunity for governments and global development agencies to discuss how to better organise the delivery of agreed levels of financial and technical assistance required by developing countries to implement these changes in governance, as well as provide a platform for national decision makers to voice opinions and share experiences.

Whilst it is by no means a new concept and despite progress in its implementation up to now being relatively limited, there has recently been a renewed international focus on a 'green economy'. As a central theme of Rio+20, significant efforts are currently underway both within and between countries to explore the institutional frameworks necessary to mainstream Green Economy efforts, and in turn how these can facilitate widespread poverty reduction. These include a series of national dialogues organised by the Green Economy Coalition seeking to engage a wide range of national stakeholders in the promotion of a country-specific vision for the

[72] The Plight of Green GDP in China, Jason N. Rauch, Consilience: The Journal of Sustainable Development, Vol 3, Issue 1 (2010) pp.102-116. (p.105)

[73] The Plight of Green GDP in China, Jason N. Rauch, Consilience: The Journal of Sustainable Development, Vol 3, Issue 1 (2010) pp.102-116 (p.113).

transition to an economy governed by norms of sustainability, thereby representing something which policy makers could be keener to implement than a set of internationally determined external mandates.[74]

Moving beyond GDP

At the macro level, greater integration of the environment and sustainability in decision-making will require sustained efforts to re-frame the measurement of progress and prosperity. A singular and narrow focus on increasing GDP will present a consistent challenge to the establishment of a legal and institutional environment that incentivises sustainable methods of consumption and production. In this regard, countries could learn from success stories in other nations that have been described above. Such transitions will nonetheless be dependent upon factors such as bold political leadership and greater regulation of industry and trade.[75]

Broadening the scope of EIAs

From a regulatory perspective, the scope of EIAs could also be broadened, incorporating the mandatory identification of how decisions and projects will contribute to sustainable development for instance. This could be particularly effective in the immediate future for industrialised countries or regions that already have the EIA infrastructures in place, simply requiring their content to be strengthened and more stringently enforced.

Institutional reforms and stakeholder engagement

For an alternative development paradigm to materialise at the national level, significant institutional reforms still need to be undertaken in most countries. Above all, many require far greater integration and alignment of priorities between environment and development authorities. Additional emphasis must also be placed on the role of community level organisations and initiatives as the 'drivers of environmental integration'.[76] Furthermore, it is at this level where the implementation of policies rooted in environmental sustainability can have the greatest effect on poverty reduction and its associated societal benefits. Whilst technical support for environmental mainstreaming continues to improve exponentially, global development agencies must be more sensitive to local contexts and increase support for indigenous institutional frameworks that are already centred upon sustainability, rather than merely imposing externally conceived paths to mainstreaming.[77]

International green tariffs

Discussions continue regarding the viability of creating an international agreement which enables the levying of taxes on products produced unsustainably. The most prominent example of which has been the Kyoto tariff, which proposes targeting countries that shun the Protocol or any such future agreements on the reductions of greenhouse gas emissions.[78] These measures would appear difficult for WTO members to bring about under the agreed rules of GATT, however these nonetheless state that GATT-inconsistent policies if these are either 'necessary to protect human, animal, or plant life or health', or relate to the 'conservation of exhaustible natural resources', therefore not ruling out the possibility of environmental tariffs coming into force in the future under the current trade system.[79]

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[74] http://www.greeneconomycoalition.org/what/national-dialogues
[75] https://community.lighting.philips.com/blogs/LightTalk/2011/03/10/green-leapfrogging
[76] challenges of environmental mainstreaming - IIED 2009, p.18
[77] challenges of environmental mainstreaming - IIED 2009, p.18
[78] International Trade and Climate Change: Economic, Legal and institutional Perspectives, World Bank (2008), p.36.
[79] http://www.wto.org/english/docs_e/legal_e/gatt47_02_e.htm

Section 2: Conservation and Management of Resources for Development

Chapter 9: Protection of the Atmosphere

Introduction

In 1992, the condition of the atmosphere was a significant concern, with climate change and climate variability, air pollution and ozone depletion recognised as key problems. At the Rio Summit, it was undertaken to (a) improve the scientific basis for decision-making; (b) promote sustainable development; (c) prevent stratospheric ozone depletion; and (d) reduce transboundary atmospheric pollution.[1] Since then, while much has been done to reduce levels of atmospheric pollution and ozone depletion, difficulties persist: particulate air pollution, for example, remains high in cities in developing countries, causing respiratory diseases and inhibiting plant growth.[2] Meanwhile, climate change has emerged as one of the most pressing issues affecting us today, threatening the very future of life on earth and presenting governments with acute difficulties. Increases in the concentration of greenhouse gases in the earth's atmosphere have led to global temperature rises, and the chief cause of greenhouse gas emissions is recognised as anthropogenic – namely, the burning of fossil fuels.[3] Undoubtedly, the question of atmospheric protection must now be posed in terms radically different to those set out in Rio, necessitating unprecedented levels of intergovernmental coordination and political commitment.

If progress on climate change and atmospheric protection were synonymous with the introduction of multilateral international agreements, implementation in the programme areas set out in Agenda 21 would have to be adjudged a success. The United Nations Framework Convention on Climate Change (UNFCCC), agreed at the Rio Summit, came into force in 1994 and aimed to prevent anthropogenic interference with the climate system.[4] The Kyoto Protocol, which commits industrialised countries to the objectives of the UNFCCC by setting binding emissions reduction targets, was agreed in 1997 and entered into force in 2007; its targets aim at a 5% reduction in emissions compared with 1990 levels by 2012.[5] The rhetoric of international climate change agreements, however, is rendered insignificant by a single bald statistic: between 1970 and 2004, annual CO_2 emissions grew by about 80%, from 21 to 38 gigatonnes.[6] Even more alarmingly, the rate of growth between 1995 and 2004 was higher than for the previous period (0.92 $GtCO_2$-eq per year compared with 0.43 $GtCO_2$-eq per year).[7] The failure to change course on carbon emissions is proving catastrophic, with a global temperature increase of 6°C or more forecast by the IEA if urgent action is not taken.[8] Even if governments succeed in implementing policy commitments to reducing greenhouse gases which are already in place, a global temperature increase of 3.5°C is expected.[9]

Implementation

Addressing the uncertainties: improving the scientific basis for decision-making

To an extent, what might have been uncertainties in 1992 have long since been replaced by the scientifically irrefutable certitude that greenhouse gas emissions occasioned by anthropogenic

[1] http://www.un.org/esa/dsd/agenda21/res_agenda21_09.shtml
[2] UN (2006), *Trends in Sustainable Development*, p. 14
[3] http://unfccc.int/essential_background/the_science/items/6064.php
[4] http://unfccc.int/essential_background/convention/items/6036.php
[5] http://unfccc.int/essential_background/kyoto_protocol/items/6034.php
[6] IPCC (2007), *Fourth Assessment Report: Climate Change 2007*, 'Synthesis Report', http://www.ipcc.ch/publications_and_data/ar4/syr/en/mains2-1.html
[7] Ibid.
[8] IEA (2011), *World Energy Outlook 2011 Executive Summary*, p. 2, http://www.iea.org/Textbase/npsum/weo2011sum.pdf
[9] Ibid.

activity have led to a dangerous increase in global temperatures. Research into climate change has improved substantially since the Rio Summit, deepening our understanding of its causes and likely effects and building an ever stronger case for action. The Intergovernmental Panel on Climate Change (IPCC), set up by the World Meteorological Organization (WMO) and the United Nations Environment Program (UNEP) in 1988, has sought to furnish governments with a clear scientific perspective on climate change, drawing on the efforts of thousands of scientists from across the world to produce its Assessment Reports, described as 'the most comprehensive scientific reports about climate change produced worldwide'.[10] The Second Assessment Report, published by the IPCC in 1995, paved the way to the adoption of the Kyoto Protocol in 1997,[11] while the Fourth, published in 2007, provided incontrovertible evidence that climate change was real, human-made and outstripping the global effort to maintain greenhouse gas emissions at a 'safe' level, leading to a ground shift in how decision-makers approached the problem.[12]

At the same time, however, there remain significant uncertainties around the issue of climate change, to a point undermining the usefulness of climate science to policy makers. Particularly, 'difficulties remain in reliably simulating and attributing observed temperature changes at smaller scales', where natural climate variability is larger and it is harder to control for external forcings, such as solar irradiance, aerosols, dust, smoke, and soot.[1314] For this reason, and in an effort to render scientific information more useful for decision-making purposes, the importance of dealing consistently and transparently with uncertainties is clearly recognised by the IPCC in preparing its assessments of climate change; authors of the Fourth Assessment Report were asked to follow a set of guidance notes on determining and describing levels of uncertainty.[15] Two types of uncertainties are identified: 'value uncertainties', arising 'from the incomplete determination of particular values or results', for example where data is inaccurate or unrepresentative, and 'structural uncertainties', arising 'from an incomplete understanding of the processes that control particular values or results'.[16] Value uncertainties are expressed probabilistically, using statistical techniques, while structural uncertainties 'are generally described by giving the authors' collective judgment of their confidence in the correctness of a result'.[17] In the Report, levels of confidence given in the context of a range that stretches from 'Very high confidence', implying a 9 out of 10 chance of being correct, to 'Very low confidence, implying a less than 1 out of 10 chance of being correct. Correspondingly, likelihood is expressed in the context of a range stretching from 'Virtually certain' to 'Exceptionally unlikely'.[18] In this way, a clear, systematic message can be delivered to decision-makers and acted upon, even as scientific work to eliminate uncertainties is ongoing.

In the context of atmospheric protection more generally, the WMO's Global Atmosphere Watch (GAW) programme has sought to maintain and apply 'global, long-term observations of the chemical composition and selected physical characteristics of the atmosphere', in order that decision makers can respond effectively to issues around ozone depletion, ultraviolet radiation, and air pollution.[19] GAW functions as a component of the WMO integrated global observing system, and is linked to a range of national, regional, and international observing projects,

[10] http://www.ipcc.ch/organization/organization_history.shtml
[11] Ibid.
[12] http://unfccc.int/essential_background/the_science/items/6064.php
[13] IPCC (2007), *Fourth Assessment Report: Climate Change 2007*, 'Summary for Policy-makers', http://www.ipcc.ch/publications_and_data/ar4/wg1/en/spmsspm-understanding-and.html
[14] http://climate.nasa.gov/uncertainties/
[15] IPCC (2007), *Fourth Assessment Report: Climate Change 2007*, 'The Physical Science Basis', http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch1s1-6.html
[16] Ibid.
[17] Ibid.
[18] Ibid.
[19] http://www.wmo.int/pages/prog/arep/gaw/history.html

programmes, systems and strategies.[20] The GAW Strategic Implementation Plan: 2008 – 2015, published in 2007, aimed to 'develop GAW into a three-dimensional global atmospheric chemistry measurement network through the integration of observations of surface-based, balloon-borne, aircraft, satellite and other remote sensing observations', introduce 'near-real-time' delivery of data, and improve quality assurance, amongst other objectives.[21] Central to the GAW Quality Assurance system currently in development is the imperative to 'reduce the uncertainty in climate models by providing information on the atmospheric distribution of sulphate and carbonaceous aerosol precursors';[22] moreover, the system calls for 'the adoption and use of internationally accepted methods and vocabulary to describe uncertainty in measurements'.[23]

Promoting sustainable development

Energy development, efficiency and consumption

Agenda 21 recognised that achieving efficiency in energy production and consumption would be central to efforts to control atmospheric emissions of greenhouse and other gases and substances, and aimed to promote environmentally sound and cost-effective energy systems. Since 1992, the need to abandon fossil fuels and embrace renewable energy has grown increasingly pressing, due to the growing threat of climate change, the increased energy needs of developing countries, and the rising cost of bringing oil to market.[24] However, between 1970 and 2004 global greenhouse gas emissions from the energy supply sector grew by 145%,[25] and there is little to suggest that real progress is being made, with demand for energy showing no signs of slowing down, fossil fuel subsidies reaching over $400 billion in 2010, and global energy intensity currently worsening.[26] According to the IEA's latest predictions, world primary demand for energy is likely to rise by a third from 2010 to 2035, leading to a corresponding 20% increase in energy-related CO_2 emissions.[27]

In 2009, world primary energy supply reached 12150 Mtoe, around double the level recorded in 1973.[28] Oil accounted for 32.8% of total energy supply, coal and peat for 27.2%, and natural gas for 20.9%; hydroelectric power, the main renewable energy source, accounted for 2.3% of total supply, and other renewable energy types such as wind and solar for a further 0.8%.[29] The failure to fully embrace renewable energy sources is central to political inaction on climate change. Since 1990, global renewable electricity production has grown at an average of 2.7% per year, failing to match the 3% growth seen for total electricity production; in 2008, only 18.5% of global electricity was sourced renewably, compared with 19.5% in 1990.[30] Slow growth in the deployment of hydroelectric power has proved a difficult obstacle, although growth in the deployment of alternative renewable energy sources has been encouraging, at 50% and 26% since 2005 for solar and wind respectively.[31] In 2010, China overtook the United States as the global leader in wind power, while Germany leads in solar capacity, followed by Spain and Japan.[32] In

[20] Ibid.
[21] WMO (2007), *Global Atmosphere Watch (GAW) Strategic Plan: 2008–2015*, pp. 2-3, ftp://ftp.wmo.int/Documents/PublicWeb/arep/gaw/gaw172-26sept07.pdf
[22] Ibid. p. 58
[23] Ibid. p. 29
[24] IEA (2011), *World Energy Outlook 2011 Executive Summary*, p. 3, http://www.iea.org/Textbase/npsum/weo2011sum.pdf
[25] IPCC (2007), *Fourth Assessment Report: Climate Change 2007*, 'Summary for Policymakers', http://www.ipcc.ch/publications_and_data/ar4/wg3/en/spmsspm-b.html
[26] Ibid. p. 1
[27] IEA (2011), *World Energy Outlook 2011 Factsheet*, http://www.iea.org/weo/docs/weo2011/factsheets.pdf
[28] IEA (2011), *Key World Energy Statistics*, p.6, http://www.iea.org/textbase/nppdf/free/2011/key_world_energy_stats.pdf
[29] Ibid.
[30] IEA (2011), *Clean Energy Progress Report*, p. 13, http://www.iea.org/papers/2011/CEM_Progress_Report.pdf
[31] Ibid. pp. 12, 40.
[32] Ibid. p. 40

order to halve energy-related CO_2 emissions by 2050, the present growth in the deployment of renewable energy technologies will have to be sustained and renewable energy use doubled by 2020.[33]

Worryingly, however, the gains made in the deployment of clean energy technologies are consistently outpaced by fossil fuel use, which continues to grow.[34] Subsidies for fossil fuel consumption represent a key problem here: in 2009, fossil fuels received USD 312 billion in consumption subsidies globally, compared with USD 57 billion for renewable energy sources.[35] Clean energy technologies struggle to compete with fossil fuels, which are aided significantly by the lack of a price for greenhouse gas emissions and other external environmental impacts.[36] Since 1970, energy-related greenhouse gas emissions have increased by over 145%,[37] due to the fact that any energy efficiency gains have been outweighed by increased energy demand, the product of global income growth and global population growth.[38] Concurrently, after 2000 the long-term trend of declining CO_2 emissions per unit of energy supplied reversed.[39]

Of course, a significant problem is that energy savings achieved by developed countries are likely to be offset by increasing energy demand in developing regions, where energy intensity is significantly inferior due to both an inability to invest in energy saving mechanisms and an absence of appropriate policy measures.[40] Yet progress in energy efficiency is faltering even in developed regions. In 2009, global energy intensity was 33% lower than it was in 1970,[41] but between 1990 and 2008, energy efficiency gains for the member countries of the International Energy Agency (IEA) for which data were available dropped to only 1% per year.[42] Even this scant progress has been reversed in the aftermath of the global financial crisis; in 2010, global energy intensity worsened for the second straight year.[43] While energy efficiency is improving in some areas, the overall picture is far less encouraging, and progress can best be described as unsteady.[44]

The potential offered by energy efficiency is not being exploited, due to widespread under-investment occasioned by manifold market, financial, information, institutional and technical barriers.[45] In 2008 the IEA published a package of 25 policy recommendations designed to enhance energy efficiency, across 7 priority areas encompassing cross-sectoral activity, buildings, appliances, lighting, transport, industry and power utilities.[46] Due to the 'pervasive, dispersed and complex' barriers to energy efficiency, the proposals were to be implemented as a whole, ensuring a holistic policy response, and early implementation was recognised as essential.[47] In 2009, IEA member countries were found to have implemented 57% of the recommendations,[48] while a second evaluation in 2011 showed further progress, but significant opportunities to

[33] Ibid. p. 9
[34] Ibid.
[35] Ibid. p. 15
[36] Ibid.
[37] IPCC (2007), *Fourth Assessment Report: Climate Change 2007*, 'Mitigation of Climate Change', http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch1s1-3.html
[38] IPCC (2007), *Fourth Assessment Report: Climate Change 2007*, 'Synthesis Report', http://www.ipcc.ch/publications_and_data/ar4/syr/en/mains2-1.html
[39] Ibid.
[40] IEA (2011), *IEA Scoreboard 2011 Executive Summary*, http://www.iea.org/Textbase/npsum/scoreboard2011sum.pdf
[41] Jackson, Tim (2009), *Prosperity without Growth*, p. 69.
[42] IEA (2011), *IEA Scoreboard 2011 Executive Summary*, http://www.iea.org/Textbase/npsum/scoreboard2011sum.pdf
[43] IEA (2011), *World Energy Outlook 2011 Executive Summary*, p. 1, http://www.iea.org/Textbase/npsum/weo2011sum.pdf
[44] Jackson, Tim (2009), *Prosperity without Growth*, p. 71.
[45] IEA (2011), *Clean Energy Progress Report*, p. 23, http://www.iea.org/papers/2011/CEM_Progress_Report.pdf
[46] IEA (2008), *Energy Efficiency Policy Recommendations*, p. 3, http://www.iea.org/G8/2008/G8_EE_recommendations.pdf
[47] Ibid. p. 6
[48] IEA (2011), *Clean Energy Progress Report*, p. 23, http://www.iea.org/papers/2011/CEM_Progress_Report.pdf

increase energy efficiency remain underutilised.[49] No single intervention will be effective on its own, and a less than comprehensive policy response is likely to be insufficient. On this basis, in 2011 the European Union (EU) published its Energy Efficiency Plan, which aims to save 20% of EU primary energy consumption by implementing measures across several sectors, including transport, industry and buildings, which were identified as offering the greatest potential for savings.[50] If in 2013 the overall EU target is unlikely to be achieved, the European Commission intends to propose 'legally binding national targets' for 2020, in a bid to 'trigger action and create political momentum'.[51]

Transportation

In 2004, transport was found to account for 13% of global greenhouse gas emissions,[52] and 23% of world energy-related CO_2 emissions.[53] Critically, greenhouse gas emissions from transport have increased more quickly than any other energy using sector, at a rate of 27% between 1990 and 2006,[54] and transport activity is expected to continue to grow over the next several decades.[55] Road transport currently accounts for 74% of total transport-related CO_2 emissions,[56] and the share of non-OECD countries can be expected to increase as global incomes grow and developing countries continue to motorise.[57] Other factors that have been significant in increasing the share of transport global greenhouse gas emissions include urbanisation, which had led to a growing demand for travel through decentralisation, increases in the size, weight and power of passenger vehicles, and a rise in freight transport stimulated by industrialisation and globalisation.[58] Moreover, global aviation CO_2 emissions were found to have increased by a factor of 1.5 between 1990 and 2000.[59]

Several initiatives to mitigate the impact of transport activity on climate change and the atmosphere can be highlighted. Many G-20 countries have set targets for the introduction of electric and plug-in hybrid vehicles, which taken together would account for 25 million vehicle sales by 2020.[60] Fuel economy has improved across many countries; the global average in 2005 was estimated to be 8.1 litres per 100 km, improving to 7.7 by 2008.[61] Congestion pricing has been introduced in over fifteen cities in OECD countries, and in London has succeeded in reducing greenhouse gas emissions by 20%.[62] More drastically, the city of Bogotá has actively restricted the number of cars permitted in its urban area, to 40 per cent of all cars during peak areas; from 2015, all private vehicles will be prohibited from entering the city during peak hours.[63] Connectively, many cities have sought to facilitate walking and cycling through measures such as widening pavements and developing networks of bicycle routes.[64] Furthermore, many countries have invested in high-speed rail networks, which in Japan carry over 1 million

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[49] IEA (2011), *IEA Scoreboard 2011 Executive Summary*, http://www.iea.org/Textbase/npsum/scoreboard2011sum.pdf
[50] European Commission (2011), *Energy Efficiency Plan 2011*, p. 2, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0109:FIN:EN:PDF
[51] Ibid. p. 3
[52] IPCC (2007), *Fourth Assessment Report: Climate Change 2007*, 'Mitigation of Climate Change', http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch1s1-3.html
[53] Ibid. http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch5s5-es.html
[54] Ibid. http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch5s5-2.html
[55] Ibid. http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch5s5-es.html
[56] Ibid.
[57] Ibid. http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch5s5-2.html
[58] Ibid.
[59] Ibid.
[60] IEA (2011), *G-20 Clean Energy, and Energy Efficiency Deployment and Policy Progress*, p.33, http://www.iea.org/papers/2011/G20_paper.pdf
[61] Ibid. p. 36
[62] UN (2011), *Technology And Policy Options For Making Transport Systems More Sustainable*, p. 9, http://www.un.org/esa/dsd/resources/res_pdfs/csd-19/Background-paper2-transport-Hargroves-Weizsacker.pdf
[63] Ibid.
[64] Ibid.

passengers a day.[65] However, the global policy response to the rise in transport activity has been largely piecemeal, and inadequate to the scale of the problem. For example, even if electric vehicles were introduced at a rate commensurate with G-20 country targets, they would only account for 2% of the world vehicle fleet in 2020, and success in reducing carbon emissions would be contingent on decarbonising electricity production.[66]

Industrial development

Between 1970 and 2004, industry-related greenhouse gas emissions increased by 65%,[67] in 2004 accounting for 19% of all emissions.[68] Since 1970, global annual production of cement increased by 271%, aluminium by 223%, and steel by 84%, energy-intensive industrial production is expected to grow further as population and per capita income continue to increase.[69] Energy-industrial activity is more than ever the preserve of developing countries, which in 2003 accounted for 78% of global cement manufacture, about 50% of global primary aluminium production, and 42% of global steel production;[70] accordingly, developing countries' share of industrial CO_2 emissions from energy use increased from 18% in 1971 to 53% in 2004.[71]

More positively, industrial sector emissions of non-CO_2 greenhouse gases decreased from 1990 to 2000, from 470 to 428 $MtCO_2$-eq/yr respectively.[72] Moreover, there is some evidence that as facilities in developing countries are new and incorporate the latest technology, they tend to have lower emission rates than older facilities in developed countries.[73] Overall, energy intensity in the manufacturing industry has been increasing by 1.3% per year since 2005, leading to a 0.6% decrease in final energy in manufacturing between 1990 and 2006.[74] Governments have sought to promote investment in energy efficient technology through tax relief, subsidies, grants and loans, while many G-20 countries are expanding their promotion of energy management in industry.[75] As part of its Energy Efficiency Plan, the EU intends to make regular energy audits mandatory for larger companies, and encourage Member States to incentivise small and medium sized enterprises to deploy energy efficient technologies.[76]

Terrestrial and marine resource development and land use

Agenda 21 aimed at conserving and enhancing sinks and reservoirs of greenhouse gases through the sustainable management of terrestrial and marine resources.[77] The precise extent to which deforestation is contributing to greenhouse gas emissions whilst reducing gross land-based sink is unclear, and the IPCC points out that 'the lack of consensus on factors that control the carbon balance is an obstacle to development of effective mitigations strategies'.[78] However, there is no doubt that measures to reduce deforestation whilst promoting afforestation are central to efforts to

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[65] Ibid.
[66] IEA (2011), *G-20 Clean Energy, and Energy Efficiency Deployment and Policy Progress*, p.34, http://www.iea.org/papers/2011/G20_paper.pdf
[67] IPCC (2007), *Fourth Assessment Report: Climate Change 2007*, 'Summary for Policymakers', http://www.ipcc.ch/publications_and_data/ar4/wg3/en/spmsspm-b.html
[68] IPCC (2007), *Fourth Assessment Report: Climate Change 2007*, 'Mitigation of Climate Change', http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch5s5-2.html
[69] Ibid. http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch7s7-1-2.html
[70] Ibid.
[71] Ibid. http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch7s7-1-3.html
[72] Ibid.
[73] Ibid. http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch7s7-1-2.html
[74] IEA (2011), *G-20 Clean Energy, and Energy Efficiency Deployment and Policy Progress*, p.15, http://www.iea.org/papers/2011/G20_paper.pdf
[75] Ibid.
[76] European Commission (2011), *Energy Efficiency Plan 2011*, p. 10, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0109:FIN:EN:PDF
[77] http://www.un.org/esa/dsd/agenda21/res_agenda21_09.shtml
[78] IPCC (2007), *Fourth Assessment Report: Climate Change 2007*, 'Mitigation of Climate Change', http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch9s9-3.html

combat climate change, and the sole cause for optimism is that the rate of deforestation has marginally declined. Between 2000 and 2005, gross deforestation occurred at a rate of 12.9 million ha/yr, compared with 13.1 million ha/y in the 1990s.[79] Taking into account afforestation efforts, net deforestation has been estimated as taking place at 7.3 million ha/yr, and is greatest in South America, Africa and Southeast Asia.[80] While the majority of forests in industrialised countries are managed according to sustainability criteria,[81] the same cannot be said for developing regions where deforestation is the product of the conversion of forests into agricultural land, settlement expansion, infrastructure, and unsustainable logging practices.[82] Deforestation is explored in detail in Chapter 11.

The ocean functions as a significant carbon sink, absorbing between 25% and 50% of all anthropogenic CO_2 emissions and thereby reducing their atmospheric concentration.[83] The role of the ocean in carbon management has received little attention in international climate change discussions, and more research is needed into the carbon deposition rates of marine and coastal ecosystems.[84] Crucially, however, as the quantities of CO_2 absorbed by the ocean increase its ability to compensate for changes to the atmosphere diminishes, limiting the capacity of management, conservation, and adaptation strategies to cope with growth in emissions.[85] This process in turn functions to drive ocean acidification, negatively impacting upon marine biodiversity and ultimately human life.[86] The relationship between the ocean and climate change is explored in more detail in Chapter 17.

Preventing stratospheric ozone depletion

Efforts to prevent stratospheric ozone depletion by phasing out CFCs have been largely successful: by 2003, developed countries had reduced CFC consumption by over 99% and developing countries by more than 50%.[87] In a continuation of this trend, the sum of CFC emissions decreased on average by 8 ± 1%/yr from 2004 to 2008.[88] Decline in the stratospheric ozone layer ceased in 1996, and average ozone values for the past decade have remained constant.[89] There is a significant delay between emission of CFCs and their diffusion into the upper atmosphere, not to mention a long residence time, but CFC concentration in the stratospheric ozone layer 'is expected to decline to pre-1980 levels in the middle of this century'.[90] Ozone is expected to increase as total emissions of ozone depleting substances continue to fall.[91] However, emissions of several ozone depleting substances continue to grow, including methane, which increased at a rate of 6.7 ± 0.6 ppb/yr from 2006–2008, and nitrous oxide which increased at 0.8 ppb/yr from 2005-2008.[92] Moreover, emissions of hydrofluorocarbons (HFCs), which have been used to replace CFCs and have an indirect impact

[79] Ibid.
[80] Ibid.
[81] Ibid. *http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch9s9-2-2.html*
[82] *Ibid. http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch9s9-2.html*
[83] *IUCN (2009), The Ocean and Climate Change: Tools and Guidelines for Action*, p. 14, http://data.iucn.org/dbtw-wpd/edocs/2009-039.pdf
[84] Ibid. p. 27.
[85] Ibid. pp. 14, 26.
[86] Ibid.
[87] UN (2006), *Trends in Sustainable Development*, p. 16, http://www.un.org/esa/sustdev/publications/trends2006/atmosphere.pdf
[88] UN (2010), *Report of the 2010 Assessment of the Scientific Assessment Panel*, 'Ozone-Depleting Substances (ODSs) and Related Chemicals', http://ozone.unep.org/Assessment_Panels/SAP/Scientific_Assessment_2010/03-Chapter_1.pdf
[89] UN (2010), *Report of the 2010 Assessment of the Scientific Assessment Panel*, 'Stratospheric Ozone and Surface UV', http://ozone.unep.org/Assessment_Panels/SAP/Scientific_Assessment_2010/04-Chapter_2.pdf
[90] UN (2006), *Trends in Sustainable Development*, p. 16, http://www.un.org/esa/sustdev/publications/trends2006/atmosphere.pdf
[91] UN (2010), *Report of the 2010 Assessment of the Scientific Assessment Panel*, 'Stratospheric Ozone and Surface UV', http://ozone.unep.org/Assessment_Panels/SAP/Scientific_Assessment_2010/04-Chapter_2.pdf
[92] UN (2010), *Report of the 2010 Assessment of the Scientific Assessment Panel*, 'Ozone-Depleting Substances (ODSs) and Related Chemicals', http://ozone.unep.org/Assessment_Panels/SAP/Scientific_Assessment_2010/03-Chapter_1.pdf

upon ozone depletion, have increased by 8-9% per year from 2004 to 2008.[93] Therefore, while progress on stratospheric ozone depletion has been extremely strong further action is needed if success is to be guaranteed into the future.

Transboundary atmospheric pollution

Since 1990, global emissions leading to O_3 and particulate matter concentrations have experienced little change or have begun to decrease, but emissions in East Asia and South Asia have increased dramatically as a consequence of economic development.[94] Crucially, however, scientific evidence suggests that concentrations and deposition of O_3, particulate matter, mercury and persistent organic pollutants are influenced by transboundary and intercontinental flows of air pollution, compromising the ability of countries to meet their own environmental policy and rendering international cooperation an imperative.[95] Transboundary issues such as acid deposition and haze caused by fires have also become significant. Programmes and partnerships have been initiated around the world to address these issues, with the EU's Regional Air Pollution Information and Simulation (RAINS) model proving to be a particularly influential example of a science-policy interface enabling integrated assessment of strategies to reduce acid deposition.[96]

The Stockholm Convention on Persistent Organic Pollutants was adopted in 2001 and entered into force in 2004, securing the cooperation of 172 nations.[97] Negotiations to develop a globally legally binding instrument on mercury are ongoing, with the goal of securing agreement by 2013.[98] For O_3 and particulate matter, a series of regional agreements are in place, of which the most significant is the Convention on Long-range Transboundary Air Pollution with 51 Parties covering the regions of North America, Europe, and Central Asia.[99] Since 1992, the Convention has been augmented by the addition of several protocols, which furnish specific emission reduction targets but lack the support of all parties.[100] Organising a global framework around existing regional agreements arguably represents the clearest path to international cooperation on O_3 and particulate matter emissions.[101]

Challenges and conflicts

Economic growth in developing regions

In 2007, developed countries accounted for only 20% of the population, but for 46.4% of global greenhouse gas emissions.[102] However, as income in developing countries increases their contribution to global CO_2 emissions is expected to rise. From 1990 to 2005, China's CO_2 emissions increased from 676 to 1,491 $MtCO_2$/yr to account for 18.7% of global emissions,[103] while energy demand in Latin America, Africa and the Middle East is expected to double over the next two to three decades.[104] According to IEA projections, non-OECD countries can be expected to 90% of energy demand growth from 2010 to 2035, with China consuming nearly

[93] Ibid.
[94] Ibid. p. 27.
[95] UN (2010), *Hemispheric Transport of Air Pollution 2010*, 'Part-D: Answers to Policy-Relevant Science Questions', pp. 3, 2. http://www.unece.org/fileadmin/DAM/env/lrtap/Publications/11-22136-Part-D.pdf
[96] http://www.iiasa.ac.at/Research/TAP/rains_europe/intro.html
[97] http://chm.pops.int/Convention/tabid/54/Default.aspx
[98] http://www.unep.org/hazardoussubstances/MercuryNot/MercuryNegotiations/tabid/3320/language/en-US/Default.aspx
[99] http://www.unece.org/env/lrtap/lrtap_h1.html
[100] http://www.unece.org/env/lrtap/status/lrtap_s.html
[101] UN (2010), *Hemispheric Transport of Air Pollution 2010*, 'Part-D: Answers to Policy-Relevant Science Questions', p. 42, http://www.unece.org/fileadmin/DAM/env/lrtap/Publications/11-22136-Part-D.pdf
[102] IPCC (2007), *Fourth Assessment Report: Climate Change 2007*, 'Mitigation of Climate Change', http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch1s1-3.html
[103] Ibid. http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch4s4-2-2.html
[104] Ibid. http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch4s4-2-3.html

70% more energy than the United States by 2035.[105] At present, developing countries display higher greenhouse gas intensities per unit of economic production process than developed countries, potentially magnifying the harmful atmospheric impact of economic growth in developing countries.[106] Meanwhile, the IPCC contends that 'the prospects for a vast expansion of motorization and increase in fossil fuel use and [greenhouse gas] emissions' as incomes in developing countries rise is 'very real',[107] demanding a comprehensive and globally coordinated policy response.

Achieving the Millennium Development Goal of halving the proportion of people living on less than a dollar a day, if not by 2015 then at some point in the future, 'implies a need for increased access to electricity and expansion of modern cooking and heating fuels for millions of people in developing countries mainly in South Asia and sub-Saharan Africa'.[108] Hopes remain that economic growth can be decoupled from growth in CO_2 emissions through technological change, increased efficiency and better policymaking.[109] However, studies have consistently found a strong correlation between GDP per capita and emissions per capita, strongly undermining the optimistic view that efficiency gains can compensate for increased energy consumption.[110] Therefore, there is a strong likelihood that climate change mitigation measures will conflict with sustainable development objectives, necessitating a clear-sighted analysis of potential tradeoffs.

Transportation

Transportation will become a serious challenge as the number of both cars and aeroplanes are expected to rise significantly over the next 20 years. Adding to difficulties, sustainable transport solutions are often location specific and not transferrable to other areas.[111] Mitigation policies may also be introduced by other international bodies. For example, the International Maritime Organisation has undertaken a feasibility study into establishing a market based framework to address greenhouse gas emissions.[112] Aviation contributes 2% to global carbon dioxide emissions and the International Civil Aviation Organisation (ICAO) is also developing a market based framework to mitigate the impact of air travel and shipping.[113] One of the goals of ICAO is to ensure a cap on carbon dioxide emission by 2020. The costs of these measures however are likely to be felt most by developing countries whose aviation and maritime sectors continue to expand, with decision makers therefore reluctant to support such initiatives.[114]

Ozone and Black Carbon

Another serious challenge is dealing with the 5.2 million tonnes of ozone destroying substances currently stored around the world.[115] Numerous research and pilot projects are currently

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[105] IEA (2011), *World Energy Outlook 2011 Executive Summary*, pp. 1-2, http://www.iea.org/Textbase/npsum/weo2011sum.pdf

[106] IPCC (2007), *Fourth Assessment Report: Climate Change 2007*, 'Mitigation of Climate Change', http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch1s1-3.html

[107] Ibid. http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch5s5-2.html

[108] Ibid. http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch4s4-2-4.html

[109] Ibid. http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch12s12-2-2.html

[110] Ibid.

[111] Commission on Sustainable Development, Policy options and possible actions to expedite implementation: air pollution/atmosphere, (New York: UN Economics and Social Council, 2006) accessed at http://www.un.org/esa/sustdev/documents/csd15/4.pdf page 23

[112] Marine Environment Protection Committee, Reduction of GHG emissions from ships Full report of the work undertaken by the Expert Group on Feasibility Study and Impact Assessment of possible Market-based Measures, (London: IMO, 2010) accessed at http://www.imo.org/OurWork/Environment/PollutionPrevention/AirPollution/Documents/INF-2.pdf

[113] Group on International Aviation and Climate Change, Report, (Montreal: International Civil Aviation Organisation, 2009) accessed at http://www.icao.int/icao/en/atb/meetings/GIACC/GiaccReport_Final_en.pdf page 6 and 7

[114] Tomilola "Tomi" Akanle, Asheline Appleton, Kati Kulovesi, Eugenia Recio, Anna Schulz, and Liz Willetts, "Summary of the Bonn Climate Change Conference: 6-17 June 2011", Earth Negotiations Bulletin, Vol. 12(513) accessed at http://www.iisd.ca/climate/sb34/ page 6

[115] Melanie Ashton, Asmita Bhardwaj, Robynne Boyd, Hal Kane, and Nicole Schabus. "Summary of the Twentieth Meeting of the Parties to the Montreal Protocol and Eighth Meeting of the Conference of the Parties to the Vienna Convention: 16-20 November 2008", Earth Negotiations Bulletin, Vol. 19(66) accessed at http://www.iisd.ca/ozone/mop20/ page 15

underway, yet countries are divided on how to fund the actual destruction of the stockpiles. Some argue destruction is outside the scope of the Multilateral Fund - created in 1991 specifically to assist developing countries meet their Montreal Protocol commitments - as these activities sit outside of the criteria for compliance.[116] Some ozone destroying substances are also greenhouse gases, such as chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs). Whilst there are currently widespread efforts to phase out the production and use of such chemicals, many countries are using hydrofluorocarbons (HFCs) to meet the targets on HCFCs, which despite not being ozone destroying are a very powerful greenhouse gas.[117] Alternatives to HFCs are not readily available and how to fund the phasing out of HCFCs remains a highly contested issue, therefore continuing to represent a significant challenge to individual nations and the international community alike despite notable progress since 1992.[118]

Improved scientific understanding of black carbon - a major component of soot resulting from incomplete combustion of fossil fuels and other biomass – has seen it become another significant issue for policymakers.[119] Black carbon increases the absorption of sunlight in the atmosphere, increasing the surface air temperature, as well as on the ground, leading to faster melting of snow and glaciers, with studies suggesting that it may be the second most important contributor to climate change.[120]

Multilateral agreements and the equitable mitigation of climate change

The impact of economic growth in developing regions upon climate change mitigation efforts connects to the issue of the equitable distribution of mitigation efforts. The Kyoto Protocol placed the burden of climate change mitigation firmly on the shoulders of developed countries, whose industrial activity over the last 150 years has accounted for the bulk of CO_2 emissions.[121] The growth in the contribution of developing regions to global CO_2 emissions is likely to complicate the picture, necessitating a re-evaluation of how the burdens of mitigation are to be shared. It is widely accepted that the impacts of climate change are unequally distributed across the world, the developing countries of the tropics expected to suffer inordinately in comparison with richer countries in temperate regions.[122] Moreover, mitigation measures are likely to imply a greater opportunity cost for developing countries, where the welfare implications will be far more profound.[123] Facilitating consensus on international agreements is likely to be contingent on questions of equity, in that individual country compliance can only be motivated by a sense of fairness.[124] However, there is considerable uncertainty over the likely future costs of mitigation measures, rendering the equitable distribution of responsibilities in the present doubly complex, while the question of intergenerational equity represents a further complicating factor.[125]

Infrastructural lock-in and path dependency

The failure of industrialised countries to meet the emissions targets set out in the Kyoto Protocol points to the difficulty of translating political will into measurable technological and institutional

[116] Ibid. page 16
[117] Ibid. page 16
[118] Melanie Ashton, Kate Harris, Tallash Kantai, Kate Neville, and Kunbao Xia, "Summary of the twenty-second meeting of the Parties to the Montreal Protocol on substances that deplete the ozone layer: 8-12 NOVEMBER 2010", Earth Negotiations Bulletin, Vol. 19(79) accessed at http://www.iisd.ca/ozone/mop22 page 15
[119] UNEP and WMO, Integrated Assessment of Black Carbon and Tropospheric Ozone: Summary for Decision Makers (Nairobi and Geneva: UNEP and WMO, 2011) accessed at http://www.unep.org/dewa/Portals/67/pdf/Black_Carbon.pdf page 2
[120] "Black Carbon E-bulletin" UNEP Division of Environmental Law and Conventions Information Resources website accessed at http://www.unep.org/dec/Information_Resources/blackcarbon.asp
[121] Ibid.
[122] IPCC (2007), *Fourth Assessment Report: Climate Change 2007*, 'Mitigation of Climate Change', http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch2s2-6-1.html
[123] Ibid. http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch2s2-6-4.html
[124] Ibid.
[125] Ibid.

progress. Significant here is the IPCC's contention that 'the 'lock-in' effects of infrastructure, technology and product design choices made by industrialized countries in the post-World War II period of low energy prices are responsible for the major recent increase in world [greenhouse gas] emissions'.[126] Embracing a new paradigm of energy production and consumption will necessitate wresting the pattern of industrial development from its present path, in which the economic activity of developed regions is firmly embedded. The fact that developing regions have yet to implement major sections of the infrastructure associated with industrial development represents a significant opportunity to place the issue of climate change at the centre of decision-making, but institutional constraints remain. Weak institutional frameworks significantly limit the capacity of developing countries to mitigate the effects of climate change, and the success of infrastructural and technological change will be heavily contingent on institutional structures embedded in potentially inflexible social and cultural contexts.[127]

Way Forward

A cross-sectoral approach

Ultimately, any successful attempt to limit damage to the atmosphere through climate change mitigation and other measures will involve coordinating responses across sectors and taking into account cross-sectoral linkages. Anthropogenic greenhouse gas emissions result from activity across a range of sectors, each influenced by its own policy frameworks, institutional mechanisms and underlying drivers of consumption and production, and policy interventions in areas with seemingly little in common will have consequences both in their own right and at the cross-sectoral level, by amplifying or limiting the impact of other measures.[128] While interventions in any one area are likely to be hampered by the nature of activity elsewhere, a holistic, coordinated policy framework has the potential to drive change across all sectors through the exploitation of synergies and careful consideration of tradeoffs.[129] In the context of energy efficiency, for example, successful interventions require action across a variety of sectors; the IEA's policy recommendations target buildings, appliances, lighting, transport, industry and power utilities. Here, cross-sectoral action functions to bind a diverse set of interventions to one another through the elimination of shared barriers and the strengthening of a common institutional architecture, for example in the facilitation of investment in energy efficiency initiatives and the development of monitoring and evaluation systems.[130] The most successful approaches, moreover, are likely to emphasise the shared objectives of atmosphere protection and sustainable development more generally, in order that potential synergies can emerge more naturally.[131] Energy efficiency represents an important example here in that emission-reductions go hand in hand with other important aims, such as increasing energy security.

An international price on carbon

The EU Emissions Trading System (EU ETS) in place in 30 countries across Europe has succeeded in putting a price on carbon emissions,[132] even if debates surround the extent to which it has succeeded in reducing emission rates.[133] Ultimately, the EU's objective is to link the ETS to carbon trading schemes around the world in order to create a global carbon market, and the decision to include international aviation in the EU ETS from 2012 could prove significant in this

[126] Ibid. http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch3s3-1-3.html
[127] http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch3s3-1-6.html
[128] IPCC (2007), *Fourth Assessment Report: Climate Change 2007*, 'Mitigation of Climate Change', http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch11s11-8.html
[129] Ibid.
[130] IEA (2008), *Energy Efficiency Policy Recommendations*, pp. 9-10, http://www.iea.org/G8/2008/G8_EE_recommendations.pdf
[131] Ibid.
[132] http://ec.europa.eu/clima/policies/ets/index_en.htm
[133] http://www.sandbag.org.uk/

regard in that it will inevitably have a global impact, and could succeed in forming a basis for concerted action on an international scale.[134] The EU expects a global carbon market to emerge through 'bottom-up linking of compatible domestic cap-and-trade systems', with an OECD-wide market by 2015 and some developing countries included by 2020.[135] Success so far might have been limited by over generous emission-allowances, but this is not to deny the potential of carbon trading to efficiently reduce emissions when applied internationally and across all economic sectors. Apart from expanding and linking existing trading systems, action to improve their effectiveness could include improving reporting and monitoring and strengthening enforcement regimes.[136] At the same time, the cross-sectoral implications of an ETS need to be considered; while the potential for interference from renewable energy policies requires particular attention.[137]

Voluntary agreements

Given the apparent difficulties involved in securing international agreement on the protection of the atmosphere, a bottom-up, voluntary approach could succeed where multilateral and 'top-down' initiatives have failed and there are no binding emission-reduction targets in place. Examples of existing voluntary agreements include the Netherlands Voluntary Agreement on Energy Efficiency, a set of legally binding agreements agreed upon by the government and 30 industrial sectors, Australia's Greenhouse Challenge Plus programme, aimed at improving energy efficiency and agreed upon by the government and an enterprise/industry association, and the European Automobile Agreement, an agreement between the EU and European, Korean and Japanese car manufacturers to reduce average emissions from new cars.[138] Voluntary agreements tend to be popular when other instruments face political opposition, and firms, and industries in general, might be persuaded by reduced legal costs and associated reputational benefits. The best voluntary agreements are likely to involve a clearly defined relationship with the overarching national and international legal-regulatory framework, formal provisions for monitoring and evaluation and an enforcement regime.[139] It is arguable whether a bottom-up approach can compensate for the failure of multilateral negotiations between national governments, but in themselves voluntary agreements undoubtedly offer potential for significant progress.

[134] http://ec.europa.eu/clima/policies/transport/aviation/index_en.htm
[135] http://ec.europa.eu/clima/policies/ets/linking/index_en.htm
[136] IPCC (2007), *Fourth Assessment Report: Climate Change 2007*, 'Mitigation of Climate Change', http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch13s13-2-1-3.html
[137] Ibid. http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch13s13-2-2.html
[138] Ibid. http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch13s13-2-1-4.html
[139] Ibid.

Chapter 10: Integrated Approach to the Planning & Management of Land Resources

Introduction

Chapter 10 of Agenda 21 – 'Integrated Approach to the Planning & Management of Land Resources' – recognises: the importance of land[1] for the maintenance of life-support systems and the productive ability of the environment; that the numerous land resource uses are often connected and may compete and conflict with one another; that land is a finite natural resource with increasing pressures placed upon it due mounting human requirements; and that land degradation can have negative impacts on agricultural productivity and rural development. Thus, the Chapter calls for a holistic and sustainable approach to the planning and management of land and land resources[2] - with particular consideration to the role of agricultural land[3] - in order to prevent and reverse land degradation. Chapter 10 states that, "by examining all uses of land in an integrated manner it makes possible to minimize conflicts, to make the most efficient trade-offs and to link social and economic development with environmental protection and enhancement, thus helping to achieve the objectives of sustainable development."[4]

Chapter 10 concentrates on one main programme area, an integrated approach to the planning and management of land resources.[5] The programme area's chief concern is the provision of a framework to coordinate decision making, with the content and operation functions of the integrated approach to the planning and management of land resources addressed in the appropriate sectoral programmes of Agenda 21 (within Chapters 11, 12, 13, 14 and 15). The broad objective[6] under this programme area is to "facilitate allocation of land to the uses that provide the greatest sustainable benefits and to promote the transition to a sustainable and integrated management of land resources", whilst concurrently considering the environmental, social and economic related issues.[7]

[1]Land is defined by the FAO as "a delineable area of the earth's terrestrial surface, embracing all attributes of the biosphere immediately above or below this surface, including those of the near surface climate, the soil and terrain forms, the surface hydrology including shallow lakes, rivers, marshes and swamps, the near-surface sedimentary layers and associated groundwater and geo-hydrological reserves, the plant and animal populations, the human settlement pattern and physical results of past and present human activity (terracing, water storage or drainage structures, roads, buildings, etc.)." Choudhury, K. and Jansen, L. (1998) Terminology for integrated land resources planning and management. Food and Agricultural Organisation of the United Nations (FAO) http://www.fao.org/sd/eidirect/land/EPre0081.htm

[2]Land resource planning is defined by the FAO as, "a systematic and iterative procedure carried out in order to create an enabling environment for sustainable development of land resources which meets people's needs and demands. It assesses the physical, socio-economic, institutional and legal potentials and constraints with respect to an optimal and sustainable use of land-resources, and empowers people to make decisions about how to allocate those resources." Land Resources, Food and Agricultural Organisation of the United Nations (FAO) http://www.fao.org/nr/land/land-policy-and-planning/en/

[3]10.6 Chapter 10, Agenda 21 http://www.un.org/esa/dsd/agenda21/res_agenda21_10.shtml

[4]10.1 Chapter 10, Agenda 21 http://www.un.org/esa/dsd/agenda21/res_agenda21_10.shtml

[5]10.5 Chapter 10, Agenda 21 http://www.un.org/esa/dsd/agenda21/res_agenda21_10.shtml

[6] There are four specific objectives under this programme area: (a) To review and develop policies to support the best possible use of land and the sustainable management of land resources, by not later than 1996; (b) To improve and strengthen planning, management and evaluation systems for land and land resources, by not later than 2000; (c) To strengthen institutions and coordinating mechanisms for land and land resources, by not later than 1998;(d) To create mechanisms to facilitate the active involvement and participation of all concerned, particularly communities and people at the local level, in decision-making on land use and management, by not later than 1996. 10.5 Chapter 10, Agenda 21 http://www.un.org/esa/dsd/agenda21/res_agenda21_10.shtml

[7]10.2 Chapter 10, Agenda 21 http://www.un.org/esa/dsd/agenda21/res_agenda21_10.shtml

Implementation

Global Initiatives

The Food and Agriculture Organisation of the United Nations (FAO) acts as the main instrument at a UN level to implement the programme areas identified in the Chapter. Assigned as the Task Manager for Chapter 10, the FAO has worked with numerous stakeholders and other UN agencies such as the United Nations Environment Programme (UNEP) and the International Fund for Agricultural Development (IFAD)[8] to develop and coordinate key actions in the implementation of all objectives in the Chapter, including: the promotion and development of planning, management and evaluation systems for land and land resources, the development of land evaluation frameworks[9]; land use databases – e.g. Africover, the Global Land Cover Network Programme, the Global Soil and Terrain database; agro-ecological zoning[10]; providing indicators of land quality – including the preparation of land degradation assessments and databases e.g. LADA[11], DESERTLINKS[12], SOLAW[13]; and providing criteria for monitoring land use systems.

Local and National Level Initiatives

At national, district and local levels, the FAO advices and works in a participatory manner with governments and other stakeholders, in the implementation of suitable land use and land management policies, strategies and action plans. Specifically such activities link to objective (d) in the programme area of Chapter 10 and examples include the facilitation and promotion of farmer field schools, conservation agriculture, and payment for ecosystem services (PES) (box 1). However, progress of further and more widespread implementation of such strategies remains limited due to lack of investment of human and financial resources[14].

Box 1: Payments for Ecosystem Services (PES) Schemes

PES schemes ensure a direct payment of compensation for the preservation or supply of an environmental service by users to the providers of such service. Payments for ecosystem services may be paid from downstream service users, conservation groups, governments, tourists and others.

Costa Rica instigated the use of PES in developing nations through the launch of a formal, nationwide initiative – *Pago por Servicios Ambientales*, PSA). Costa Rica's PSA initiative began in 1997 and has been ascribed as playing an important role in reducing the country's deforestation levels – Costa Rica once had one of the world's highest deforestation rates and in the early 2000s this was reduced to a negative net level.

Pagiola, S. (2006) Payments for Environmental Services in Costa Rica http://mpra.ub.uni-muenchen.de/2010/1/MPRA_paper_2010.pdf

[8]The International Fund for Agricultural Development (IFAD) - an agency of the United Nations. http://www.ifad.org/

[9]The FAO developed a broad land evaluation framework in 1976, *A framework for land* evaluation (http://www.fao.org/docrep/X5310E/X5310E00.htm) and specific frameworks for rainfed agriculture, forestry, irrigated agriculture and for extensive grazing in, 1983, 1983, 1985 and 1991, respectively. In 2007 the FAO began the process of revising the current framework addressing the need for change in scope and purpose for land evaluation: http://www.fao.org/nr/lman/docs/lman_070601_en.pdf

[10]The FAO define agro-ecological zoning (AEZ)as defining zones on the basis of combinations of soil, landform and climatic characteristics

[11]Land Degradation Assessment in Drylands http://www.fao.org/nr/lada/

[12]Combating Desertification in Mediterranean Europe: Linking Science with Stakeholders http://www.kcl.ac.uk/projects/desertlinks/

[13]State of Land and Water – a global status report on land and water resources http://www.fao.org/nr/solaw/solaw-home/en/

[14]UNESC (2009) Policy options and actions for expediting progress in implementation: land, Report of the Secretary-General http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/651/82/PDF/N0865182.pdf?OpenElement

Brazil: PES schemes for forest conservation have been established for the State of Amazonas as a component of the package in its 2007 Climate Change Law.

FAO (2007) State of Food and Agriculture: Paying farmers for environmental services ftp://ftp.fao.org/docrep/fao/010/a1200e/a1200e00.pdf

Since the UNCED, there has been a move away from centralised natural resource management towards more decentralised models – Community-Based Natural Resource Management (CBNRM), which act to support local level institutions for natural resource – such as land – management and use, empowering and enabling local people to make more informed decisions over the use of their natural resources. Examples of successful case studies in relation to land can be found in box 2.

Box 2: Community Based Natural Resource Management

Tanzania: Presently, over 3.6 million hectares of forests and woodlands are managed as 'Village Land Forest Reserves' – run exclusively by locally elected village governments, or as co-managed forests through villages and either local or central government.

Ghana: Under the Community Resource Management Area Policy of 2000, 200,000 hectares of forest are now managed through communities, who have the authority to manage the access to and harvesting of natural resources within their areas. As a result of such, illegal activities, such as deforestation, are reducing.

Technology and Information Systems

Technological advancements and information systems are important in order to successfully manage land in an integrated way. Technologies can reduce the pressures upon the natural resource base, for example by reducing the need for external inputs and through improving yield quantity and quality. Information and monitoring systems can support improved land management and planning through enhancing the knowledge of land use change and the status and trends of land resources and ecosystems. Additionally, such advancements in technology and information systems can reduce transaction costs of land planning and management (box 3). Implementing new technologies and information systems links directly to objectives (c)[15] and (b)[16], respectively. Traditional and indigenous knowledge is important in informing, developing and implementing such technologies and systems and can ensure that they are more applicable and appropriate for use on-the-ground. The consideration and participation of the public and the use of such knowledge was highlighted in Chapter 10 as an objective under its programme area[17].

Box 3: Using information technology systems in land titling

Land titling remains an important process in securing land tenure for individuals and communities across the world. The process in often time-consuming However, with the advancement in information and communication technologies (ICT) and with the widespread adoption of electronic ICT systems the process in many areas is becoming shortened. Additionally, transaction costs have been reduced.

UNESC (2009) Policy options and actions for expediting progress in implementation: land, Report of the Secretary-General

[15] 10.7 Chapter 10, Agenda 21 *Objective (c) to improve and strengthen planning, management and evaluation systems for land and land resources, by not later than 2000.* http://www.un.org/esa/dsd/agenda21/res_agenda21_10.shtml

[16] 10.8 Chapter 10, Agenda 21 *Objective (b) to improve and strengthen planning, management and evaluation systems for land and land use resources, by not later than 2000.* http://www.un.org/esa/dsd/agenda21/res_agenda21_10.shtml

[17] 10.10 Chapter 10, Agenda 21 *Promoting public participation* http://www.un.org/esa/dsd/agenda21/res_agenda21_10.shtml

Within the two decades since UNCED, there has been an increase in the number of international and regional initiatives and institutions that address land resource issues – noteworthy examples can be seen in box 4: Such projects - delivering data and knowledge on ecosystems, land use and land resources - are crucial for the advancement and development of perspective studies and scenarios at regional and national levels, which may direct decision-making on future policies of land use and land management.

Box 4: International and Regional Initiatives

The International Land Coalition (ILC): The ILC is an international alliance comprised of civil society and intergovernmental organisation. Through advocacy, discussion, information sharing, knowledge transfer and capacity-building, the ILC acts to promote the secure and equitable control over and access to land for poor individuals within society in as a mechanism to reduce poverty and a tool to bring about identity, assurance and inclusion.
http://www.landcoalition.org/

DESIRE projects: The DESIRE research project is an international collaboration between 28 research institutes, non-governmental organisations (NGOs) and policy makers working to combat land degradation. Funded through the EU's Sixth Framework (FP6), the aim of the project is to develop alternative and integrated approaches for sustainable land management in areas experiencing land resource issues. The project will be established in 18 'hotspot' areas identified as experiencing land resource issues. These areas will act as 'global laboratories' for the application of existing and developing conservation techniques and remediation methods. Ultimately, the project aims to create practical guidelines for responsible land use. The project contains a high level of stakeholder participation, with researchers working directly with the hotspot communities, making inventories of local and traditional knowledge and current land use practices with the aim of developing acceptable, realistic and appropriate conservation techniques.
http://www.desire-project.eu/.

TerrAfrica Response: The TerrAfrica partnership is a collaborative response to land resource issues in Africa by the African Union, the World Bank, the United Nations, the European Commission and regional sub-Saharan African governments. The response began in 2005 and aims to create an enabling environment for mainstreaming and financing effective nationally-drive sustainable land management strategies in order to combat land degradation and desertification.
http://www.terrafrica.org/

Successful examples of such technologies and systems include, early-warning weather systems, decision support systems, integrated pest management and conservation agriculture. Both the quality and quantity of land use information is improving through such technologies such as geographic information systems (GIS) and geographic positioning systems (GPS), of which are being utilised alongside socioeconomic data to inform a comprehensive collection on land-use[18]. Despite success, there lacks the development of an integrated approach at a national level, with national actions plans in relation to land use remaining disjointed with associated sustainable development strategies[19]. Particularly at the national level, the implementation of integrated planning and management approaches for land resources is inadequate, with an insufficient pro-poor approach and significant weaknesses in technology dissemination to the district and local level.

Land Security

Securing land tenure is particularly important for the implementation of objectives (a) and (d) for the active involvement and participation of stakeholders concerned at the local level in decision-making on land use and management.

[18] UNESC (2009) Policy options and actions for expediting progress in implementation: land, Report of the Secretary-General http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/651/82/PDF/N0865182.pdf?OpenElement

[19] Ibid

Secure rights to land are imperative in ensuring sustainable land management, with insecure land tenure hampering a variety of sustainable development efforts. With secure access to land local individuals and communities have ownership and empowerment, which can increase the likelihood of them investing in sustainable land practices, which can, in turn will increase agricultural productivity levels, and will aide in reducing poverty levels and lead to more sustainable forms of development. Secure land access can also prevent land related conflicts[20]. Furthermore, tenure security allows non-farm income generation and the diversification of livelihoods through using land as collateral – through the rent or sale of land[21].

Evidence demonstrates that long-term tenure security promotes improved natural resource management decisions[22] and is crucial for civil peace and food security[23]. A noteworthy and positive example of securing access and tenure to land and agricultural systems at a national level include the formalisation of ancestral land rights in Bolivia (box 5).

Box 5: The Formalisation of Ancestral Land Rights in Bolivia
IFAD's Sustainable Development Project by Beni Indigenous People (PRODESIB) was introduced in order to provide land security to indigenous peoples – Tacanas, Chimanes and Trinitarios – through actively supporting their organisation and involving them in the land reform process. Land was identified and differentiated and consultations were held with the present occupants of the land. The project ran for eight years and as a result, approximately 1.3 million hectares of land were defined and titled, benefiting 15,500 individuals in 157 communities. This project is presently being expanded by national level and regional level governments in Bolivia.

IFAD (2010) Land tenure security and poverty reduction http://www.ifad.org/pub/factsheet/land/e.pdf

Despite such progress land rights issues remain a major challenge to land planning and management and approaches to resolve this issue have seen much criticism[24].

Climate change and carbon sequestration
Since the UNCED the issue of climate change has become a central focus of the land management agenda, specifically in recognition of the role that land management can play in either producing or absorbing carbon. Improved land management practices that can aid in carbon sequestration and mitigation and adaptation to climate change include, rehabilitating degraded crop and pasture land, PES and RES schemes enhanced farming practices, planting forests, carbon-trading schemes, soil and water conservation.

Challenges and Conflicts

Integrated sustainable land management will be increasingly important given the multiple and conflicting demands on land use as a result of a growing population and other development

[20] UNESC (2008) Review of the implementation on land, Report of the Secretary-General http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/235/17/PDF/N0823517.pdf?OpenElement
[21] International Land Coalition (2004) Turning Assets in LDCs into Useable Capital to Enhance Resources to Achieve the MDGs http://www.landcoalition.org/program/advec04ip.htm
[22] Feder, 1988; Otsuka and Place, 2001 from International Land Coalition (2004) Towards a Common Platform: The Catalyst to Reduce Rural Poverty and the Incentive for Sustainable Natural Resource Management. International Land Coalition, Rome http://www.urbantimeline.org/files/Land%20Tenure%20and%20Policy%20in%20Southeast%20Asia.pdf
[23] de Soto, 2000; Lavigne Delville, 2002 from International Land Coalition (2004) Towards a Common Platform: The Catalyst to Reduce Rural Poverty and the Incentive for Sustainable Natural Resource Management. International Land Coalition, Rome http://www.urbantimeline.org/files/Land%20Tenure%20and%20Policy%20in%20Southeast%20Asia.pdf ; International Land
[24] Hirsch (2011), Titling against grabbing? Critiques and conundrums around land formalisation in Southeast Asia http://www.iss.nl/Menupages/Research-Networks/The-Land-Deal-Politics-Initiative-LDPI/April-2011-IDS-Sussex2/LDPI-Conference-Papers/Titling-against-grabbing-Critiques-and-conundrums-around-land-formalisation-in-Southeast-Asia

conflicts, such as economic development, urbanisation, increasing demand for biofuels, and the continued move in human diet away from cereal-based to animal-based produce. Such global trends are increasing the demands for natural resources, for food, energy and raw materials, and necessitate increased inputs of land and water resources, having ramifications for land uses.
The main challenges preventing successful implementation of Chapter 10 include institutional incoherence, urban expansion, insecure land tenure, community capacity, dissemination of land-use planning technologies and data provision across all levels. It is important to address these challenges in order for sustainable and effective land management, particularly so with the expected growth in human population – estimates of world population in 2050 are 9.2 million[25] which will decrease the average availability of land per person globally.

Drivers of Land Use Change

Land-use change (LUC) refers to alteration of global terrestrial ecosystems, by humans, for the production of food, fuel and fibre. Whilst humans have been making such alterations for thousands of years, current levels of LUC, and the extent and intensities at which such change is occurring is now considerably larger than ever before, leading to unparalleled changes to environmental processes and ecosystems at local, national, regional and global levels. The scientific examination of both the causes and consequences of LUC necessitates an interdisciplinary method that incorporates natural and social scientific approaches. Considering the driving forces of LUC is crucial in order to predict potential LUC patterns and develop successful and appropriate policies and programmes to mitigate the negative impacts – for example, biodiversity loss, the releasing of carbon dioxide, pollution – of such. There are several drivers of LUC, many of which feedback between each other. Drivers can comprise of virtually every factor which affects human action, examples of such drivers include: economic (demand for products, financial motivation); environmental (quality of soil, availability of moisture); socio-cultural, e.g. food preferences; and land policy and development programmes, for example, road construction, zoning and agricultural programme[26]. In developed, threshold and developing countries, control over LUC is limited, particularly so in the presence of institutional, statutory and policy inadequacies. Whilst, in some cases, legal frameworks around LUC exist, the compliance to them is low, with governments having very limited control on how LUC operates and occurs.[27]

Institutional Incoherence

The many various uses of land resources are managed at a national level through different Government Ministries – for example, agricultural, forestry, mining, tourism, rural planning, and urban planning – often in an uncoordinated manner. Therefore, the level of competition between the different land use options can often result in conflict and discord in land use planning and management, with each management body often holding different concerns, priorities and approaches. Such institutional dissonance impedes the required level of coordination and communication for an integrated approach to the planning and management of land resources.[28] This incoherence is replicated to a degree at the international level, with numerous UN agencies and Conventions – for example, UNCCD, UNFF – which itself, presents a further challenge to a

[25] UNESC (2009) Policy options and actions for expediting progress in implementation: land, Report of the Secretary-General http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/651/82/PDF/N0865182.pdf?OpenElement
[26] Ellis, E. (2010) Land-use and land-cover change. In Cutler, J. (ed) Encyclopaedia of Earth. Washington, D.C.: Environmental Information Coalition, National Council for Science and the Environment
[27] Loehr, D. (2010) Land Conversion Out of Control – How to Achieve Better Governance. Presented at the FIG Congress: Facing the Challenges – Building the Capacity, 11-16th April 2010, Sydney Australia.http://www.fig.net/pub/fig2010/papers/ts03e%5Cts03e_loehr_4666.pdf
[28] Wit, P.De. and Verheye, W.H. (2003) Land Use Planning for Sustainable Development. http://www.eolss.net/ebooks/Sample%20Chapters/C19/E1-05-03-01.pdf In Land Use, Land Cover and Soil Sciences, EOLSS Publishers, Oxford

coordinated and integrated approach to the planning and management of land resources. Chapter 10 has been challenged as being too narrow - particularly in regard to the strong agricultural focus[29] - again preventing an integrated and holistic approach. The pace of progress for the implementation Chapter 10 of Agenda 21 thus remains uneven and inefficient with a large unnecessary overlapping and conflicts in efforts at various government levels.

Urban Expansion

The majority of global population growth is expected to occur in urban areas of developing countries, a large proportion of which will be found in slums[30] — represented by substandard housing, overcrowding, lack of clear tenure agreements, and absence of basic services such as electricity, sanitation and safe water. Urban settlements depend on surrounding rural land for services – provision of food and water, waste disposal and recreation, in addition for land for the growth in urban settlements. 19.5 million hectares of agricultural land is transformed to expanding urban regions and industrial developments[31]. The lack of integrated planning for urban land-use and the interaction between urban and rural settlements further impedes efforts of sustainable land planning and management. This is particularly true within coastal regions as they are among the most crowed areas in the world, suffering from high levels of pollution from land-based activities, and negatively affected as a result of physical alterations – e.g. upstream dam construction[32]. Such uncontrolled urban growth can augment land resource degradation and land-use conflicts[33]. This issue must be appropriately addressed in order to sustain urban and rural livelihoods and ecosystems.

Insecure Land Tenure

The challenge of insecure land tenure is particularly acute in rural societies, particularly in Latin America and South and Southeast Asia[34]. Individuals and communities who are landless, near-landless and who have insecure tenure rights comprise the most vulnerable groups. This challenge is also extremely gendered, with women often having little or no land rights[35] – this has been a particular challenge in South East Asia[36]. Addressing this challenge is becoming increasingly important, particularly with the increasing global human population, climate change, declining soil fertility and with the mounting commercial interests in land for the large-scale infrastructure projects, carbon-trading, mining and the production of food, timber and biofuels.

Concomitantly, external rural development schemes and programmes may jeopardize the rural poor's access to land and land tenure security. For example, the introduction of infrastructure systems, such as roads, or the introduction of modern technologies or irrigation projects will regularly increase the value of the land. Such increases in the economic potential of the land can often result in small-scale producers losing the land to wealthier or more powerful settlers. In this

[29] FAO-UNEP Workshop on Integrated Planning and Management of Land Resources (1998) http://www.mpl.ird.fr/crea/taller-colombia/FAO/AGLL/pdfdocs/workshop.pdf
[30] The United Nations Human Settlements Programme (UN-Habitat) State of the World Cities 2008/2009 http://www.unhabitat.org/pmss/listItemDetails.aspx?publicationID=2562
[31] UNESC (2009) Policy options and actions for expediting progress in implementation: land, Report of the Secretary-General http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/651/82/PDF/N0865182.pdf?OpenElement
[32] United Nations Environment Programme (UNEP), Global Programme of Action for the Protection of the Marine Environment from Land-based Activities http://www.gpa.unep.org/
[33] UNESC (2009) Policy options and actions for expediting progress in implementation: land, Report of the Secretary-General http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/651/82/PDF/N0865182.pdf?OpenElement
[34] UNESC (2008) Review of the implementation on land, Report of the Secretary-General http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/235/17/PDF/N0823517.pdf?OpenElement
[35] Oxfam, Growing a better future (2011) http://www.oxfam.org.uk/resources/papers/downloads/cr-growing-better-future-170611-en.pdf
[36] The International Fund for Agricultural Development (an agency of the United Nations) IFAD http://www.ifad.org/english/land/index.htm [accessed 21/06/2011]

regard, when inadequate and unsatisfactory attention is given to land access and tenure issues, rural development schemes can exacerbate land and land tenure insecurity problems[37].

Land Grabs

Increasing competition for land is probably the single biggest challenge to ensure sustainable land management, particularly in the context of 'land grabs': 'Land grabbing' by foreign 'investors' is becoming an increasing challenge and in its current form, is guaranteed to have negative consequences for sustainable land use and management. Presently, it is estimated that among 15 to 20 million hectares of land have been subject to 'land grabs'[38]. The increasing interest in land and the increasing competition for land resources has led to a reduction in available land and land resources, whilst leading to an increase in its economic value. Whilst such trends can lead to increased foreign investment for developing countries, often they have threatened the land rights of small-scale producers and indigenous communities, for example the loss of customary land rights with no, little or inequitable compensation for customary users. Indeed, a World Bank study discovered that such 'investors' were targeting nations with the greatest institutional – in regard to tenure security – weaknesses[39].

Corruption

The issue of land grabs is exacerbated through corruption within Governments and elites in developing countries, who are providing huge areas of land at low prices. Such corruption is allowing large companies and investors access to cheap areas of land, whilst leaving rural communities with reduced livelihood opportunities and low or little food security[40]. This issue, as with land grabs, has worsened since the peak of the 2008 food price crisis and remains a persistent source of tenure, livelihood and food insecurity.

Way Forward

Climate Change

A foremost emerging issue directly associated with the programme areas outlined in Chapter 10 - that was not addressed at the time of Agenda 21 - is climate change. Climate change holds great consequence for land-use policy and administration, whilst land –use policy and administration holds great consequence for climate change mitigation and adaptation, for example, as land provides a sink for carbon.

There is an urgent call for policies and programmes at the national level with an increased focus on land-use policies and land use administration which avert land degradation, prevent the loss of agriculturally productive areas, reclaim degraded land for productive use, and protect biodiversity. Yet, there is the pressing need for such policies, programmes and action plans to endeavour at adapting to and mitigating the impacts climate change, for example, sudden and extreme weather events and natural disasters – such as, droughts, floods and landslides[41]. The planning and management of land resources and land-use can improve the resilience of communities affected by climate change. An example of such for areas susceptible to climate

[37] The International Fund for Agricultural Development (an agency of the United Nations) IFAD http://www.ifad.org/english/land/index.htm [accessed 21/06/2011]
[38] Liversage, H. (2010), Responding to 'land grabbing' and promoting responsible investment in agriculture, IFAD http://www.ifad.org/pub/op/2_e.pdf p7
[39] World Bank (2010) Rising Global Interest in Farmland, http://siteresources.worldbank.org/INTARD/Resources/Joint_Issues_Note_54_v6.pdf
[40] Oxfam, (2011) Growing a better future: Food justice in a resource-constrained world, p18 http://www.oxfam.org.uk/resources/papers/downloads/cr-growing-better-future-170611-en.pdf
[41] UNESC (2009) Policy options and actions for expediting progress in implementation: land, Report of the Secretary-General, p11 http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/651/82/PDF/N0865182.pdf?OpenElement

change impacts, are the adoption of zoning laws[42], the discouragement of settlements in areas susceptible to natural disasters, and the promotion of adapted land-use technologies[43].

Adapting communities to climate change necessitates the implementation of suitable response options in risk reduction and strengthening the coping capacities of individuals and communities threatened by the effects of climate change. Such response options must consist of instruments that assure the fortitude of livelihoods and the long-term and lasting and adaptation of land-use systems[44]. Such policies and programme must be adapted to each context, tailored to the ecological, socio-economic and cultural surroundings, and must build upon the indigenous knowledge and cultural value structures[45].

Land Tenure

Ensuring land tenure security and equitable access to land and other natural resources is fundamental for ensuring sustainable development and rural poverty reduction. As such, there is the need for policies that promote the allocation of land rights or the granting of long-term leases. Reforms are required in land governance efficiency in both formal and customary land tenure agreements and administration in order to evade or reduce the unfavourable consequences of inadequately governed systems[46]. Examples of such reforms include, providing incentives for investing in land management, improving institutional and technical facilities, strengthening data quality and information management systems and ensuring the sufficient protection of land rights[47].

However, land tenure reform is not the sole and guaranteed solution to ensure the integrated management of land resources. It will not solve rural poverty or ensure sustainable natural resource use without investments and support in other areas. In order to be constructive, methods to strengthen land tenure must be supported with pro-poor strategies, services and investments, and through the effective engagement and participation of all stakeholders – particularly women and indigenous peoples - to ensure ownership at the local level.. In addition, there must be regional and international policies in place to address matters that traverse regional and national borders, such as migration and pastoralism[48].

Land Grabs

Since Agenda 21, land tenure security issues have been compounded by increased competition for land as a result of population growth, spreading settlements, expanding infrastructure, tourism expansion, economic growth, increases in bio-fuel production, and endeavours to encourage agricultural development. This requires actions which address the equity and effectiveness of land planning, management and allocation[49]. In addition, in order to address diminishing land availability, there is the need to direct actions towards increasing land productivity, particularly in Small Islands States[50], where the issue of land scarcity is most prominent.

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[42] Ibid
[43] Ibid, p7
[44] Ibid, p21
[45] Ibid, p11
[46] UNESC (2009) Policy options and actions for expediting progress in implementation: land, Report of the Secretary-General, p21 http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/651/82/PDF/N0865182.pdf?OpenElement
[47] Ibid
[48] IFAD http://www.ifad.org/english/land/index.htm [accessed 29/06/2011]
[49] Ibid, p20
[50] Ibid

Chapter 11: Combating Deforestation

Introduction

The unprecedented incremental increase in global rates of deforestation[1] during the latter half of the 20th Century saw the protection of the world's diverse forms of woodland become a major priority for both the global population and international decision makers. Existing methods of forest resource management were proving inadequate to prevent the seemingly irreversible loss of forest lands and their diverse ecosystems. Calls for multilateral action to effectively tackle the issue were in general trumped by the perceived sovereign right of nations to use forest resources first and foremost as a means to ensure economic development.

Nonetheless this period also saw the non-timber values of forests begin to be recognised by scientists, policy makers and businesses alike. While this was not always beneficial to reducing deforestation - as the explosive rates of forest conversion to agricultural land will attest - it served to expand and modernise understandings of the issue, seeing a movement away from purely protectionist conservation approaches to those which also incorporate sustainable use.[2] It was therefore clear that any successful attempts at reducing deforestation rates could only occur within the context of securing sustainable development. Moreover any international agreement on the rules, responsibilities and rights of both governments and forest communities, would need to understand and account for the dialectical relationship between deforestation and the use of woodlands as a legitimate means of economic growth.

In 1992, therefore, when the world's nations convened in Rio for the first Earth Summit, a direct attempt was made to explicitly identify and form a global consensus on the prevailing 'major weaknesses in the policies, methods and mechanisms adopted to support and develop the multiple ecological, economic, social and cultural roles of trees, forests and forest lands'.[3] The holistic analysis and debate on the topic undertaken at the Summit culminated in the creation of a specific chapter in Agenda 21 that focussed on Combating Deforestation, as well as a set of Forest Principles which together placed a clear focus on a new international process of sustainable forest management.[4] Chapter 11 contained four key programme areas, seeking to represent a 'global consensus on the management, conservation and sustainable development of all types of forests'.[5]

Implementation

Deforestation Rates and Impacts

In the last two decades the overall rate of deforestation has shown signs of decreasing, with the global rate falling from approximately '0.22 percent in the 1990s to 0.18 percent in the 2000s'.[6] In the last decade (2000-2010) some 13 million hectares of forest were lost through conversion to agriculture or as a result of natural causes (primarily forest fires), compared with 16 million hectares in the preceding decade (1990-2000).[7] However this cannot be attributed to an overall decrease in wood removals, as its current rate remains similar to that of the early 1990s. Rather it

[1] Note: "Deforestation" implies that forests are cleared by people and the land converted to another use, such as agriculture or infrastructure. Natural disasters may also cause destruction of forests or deforestation for certain time periods or permanently, but globally this is by far less relevant than clearing by people.
[2] http://www.fao.org/docrep/013/i2000e/i2000e.pdf (pp.86-7)
[3] Agenda 21, Section II, Chapter 11, United Nations 1992.
[4] http://www.fao.org/docrep/013/i1757e/i1757e.pdf (p2)
[5] http://www.un.org/documents/ga/conf151/aconf15126-3annex3.htm
[6] http://siteresources.worldbank.org/EXTFORSOUBOOK/Resources/completeforestsourcebookapril2008.pdf (p124)
[7] http://www.fao.org/docrep/013/i1757e/i1757e.pdf (p10)

is primarily due to the significantly increased global levels of planted forest through either afforestation (the establishment of forest where there was none previously) or reforestation (replanting in degraded former forest lands); with increasing the levels of both being major objectives of the Chapter.[8] This has been especially evident in Asia and the Pacific which went from a net loss of 0.7 million hectares of forest per year during the 1990s to a net increase of 1.4 since 2000, primarily due to large-scale afforestation programmes in China, India and Vietnam.[9] Nonetheless the UN Food and Agriculture Organisation (FAO) stresses that the current rate of deforestation is still 'alarmingly high' with an overall area approximately the size of Costa Rica still being lost each year.[10]

Forests contain over half of all terrestrial plant and animal species, therefore deforestation remains one of the primary causes of biological diversity loss.[11] The last two decades have seen a significant increase in efforts to conserve biodiversity through the establishment some 94 million hectares of legally protected forest areas globally since 1990, with two thirds of this increase occurring since 2000 (see Table 1).[12] Costa Rica, for example, in the decade following the Summit provided approximately $30 million to landowners to establish or protect over 280,000 hectares of forests and their environmental services.[13] Yet the numerous challenges to the implementation and enforcement of protection status in many countries - especially those in the South – has failed to halt the persistent destruction of primary forest (more than 40 million hectares since 2000) which contain the world's most diverse and species rich ecosystems.[14] This has been mitigated against somewhat by an average of over 10 million hectares per year between 1998 to 2007 being afforested and reforested mostly with indigenous species.[15] However approximately 29 percent of afforestation and 36 percent in reforestation efforts has used introduced species, thereby creating new areas unable to host the range of biodiversity of the natural forest they often replace.[16] For example, biodiversity remains particularly threatened in many areas of Mozambique due to large scale afforestation with alien species, exacerbated by weak regulations and favourable growing conditions.[17]

[8] http://www.fao.org/docrep/013/i1757e/i1757e.pdf (p50)
[9] http://www.fao.org/docrep/013/i2000e/i2000e.pdf (p.x)
[10] http://www.fao.org/docrep/013/i1757e/i1757e.pdf (pp.xiii,10)
[11] Global Biodiversity Outlook 3, Convention on Biological Diversity, 2010, p.32.
[12] http://www.fao.org/docrep/013/i1757e/i1757e.pdf (p50)
[13] http://www.millenniumassessment.org/documents/document.354.aspx.pdf, pp.11,70.
[14] http://www.fao.org/docrep/013/i1757e/i1757e.pdf (p50)
[15] http://www.fao.org/docrep/013/i1757e/i1757e.pdf (p86)
[16] http://www.fao.org/docrep/013/i1757e/i1757e.pdf (p86); Brockerhoff, Eckehard G.; Jactel, Hervé; Parrotta, John A.; Quine, Christopher P.; Sayer, Jeffrey (2008): Plantation forests and biodiversity: oxymoron or opportunity? Biodiversity Conservation (2008) 17:925–951; DOI 10.1007/s10531-008-9380-x
[17] http://www.millenniumassessment.org/documents/document.354.aspx.pdf, p.65

Table 1. Area of forest in protected areas by region and subregion, 2010

Region/subregion	Information availability		Area of forest in protected areas	
	Number of countries	% of total forest area	1 000 ha	% of forest area
Eastern and Southern Africa	18	87.1	27 492	11.8
Northern Africa	5	98.5	13 986	18.0
Western and Central Africa	20	94.1	41 707	13.5
Total Africa	**43**	**91.8**	**83 185**	**13.4**
East Asia	4	97.6	43 752	17.6
South and Southeast Asia	11	88.5	80 303	30.8
Western and Central Asia	11	46.7	1 447	7.1
Total Asia	**26**	**89.3**	**125 502**	**23.7**
Europe excl. Russian Federation	35	93.4	22 475	12.3
Total Europe	**36**	**98.7**	**40 047**	**4.0**
Caribbean	9	50.4	779	22.3
Central America	4	60.7	6 501	54.9
North America	4	100.0	63 572	9.4
Total North and Central America	**17**	**98.4**	**70 852**	**10.2**
Total Oceania	**7**	**99.1**	**30 640**	**16.2**
Total South America	**6**	**74.6**	**109 806**	**17.0**
World	**135**	**91.0**	**460 032**	**12.5**

Source: http://www.fao.org/docrep/013/i1757e/i1757e.pdf, p.60

Overall rates of deforestation are also undoubtedly higher than estimated due to the large size of the informal forestry sector - which employs 30-35 million people primarily in developing countries - that engages in widespread unrecorded timber removal processes, in particular for use as wood fuel and commercial illegal logging.[18] Conversely, despite reaching its peak in 2004, the last decade has seen a significant decrease in illegal logging in many of the countries where it has traditionally been most prevalent, including reductions estimated by some to be between 50 and 75 per cent in the Brazilian Amazon and 75 per cent in Indonesia.[19] This has been a major contributing factor to an overall decrease in deforestation in these countries, which individually accounted for the highest net losses of forest in the 1990s.[20]

International, regional and national instruments

Many of these aforementioned gains in decreasing rates of deforestation have occurred as a direct consequence of the international, regional and national instruments adopted since the UNCED. At the global level, under the auspices of the UN Commission on Sustainable Development (CSD), the Intergovernmental Panel on Forests (IPF) from 1995 - 1997 and the Intergovernmental Forum on Forests (IFF) from 1997 – 2000 were the principle intergovernmental mechanisms for the development of international policies on sustainable forest management.[21] To compliment these panels, an informal, high level Interagency Task Force on Forests (ITFF) was created in 1995 to

[18] http://siteresources.worldbank.org/EXTFORSOUBOOK/Resources/completeforestsourcebookapril2008.pdf (p16); http://www.fao.org/docrep/013/i1757e/i1757e.pdf (p86)
[19] http://www.chathamhouse.org.uk/files/16950_0710pr_illegallogging.pdf (p.xiii)
[20] http://www.fao.org/docrep/013/i1757e/i1757e.pdf (p10)
[21] http://www.un.org/esa/forests/about-history.html

'coordinate the inputs of international organizations to the forest policy processes'.[22] Although not legally binding, those participating in the IPF/IFF processes are under a certain level of political obligation to implement their policy recommendations at the national level.

In 2000, a UN Economic and Social Council (ECOSOC) Resolution saw the establishment of the UN Forum on Forests (UNFF), tasked with continuing the implementation of the recommendations made by the IPF/IFF, with members convening each year to create detailed plans of action (UNFF1-9) leading to the adoption of several important resolutions on deforestation. These included the 2007 Non-Legally Binding Instrument on All types of Forests[23] which attempted to modernise and consolidate the findings of Agenda 21 to produce a reference framework for member states to consider when implementing programmes of sustainable forest management.[24] The UNFF continues to receive direct support from a coalition of fourteen international organisations called the Collaborative Partnership on Forests (CPF) which includes the FAO, World Bank, International Tropical Timber Organization and Centre for International Forestry Research (CIFOR), aiming to enhance policy coordination through conducting extensive research programmes, the classification of different types of forest, and the publication of forest usage/resource indicators that both regional and national sustainable forest management policies depend upon.[25]

With 192 member states, the UNFF is the only body apart from the UN General Assembly with full global participation.[26] This level of inclusivity is a direct improvement on the IPF/IFF processes which were only followed by certain countries, therefore exerting minimal political obligation on non-participating nations to review their existing national forest management strategies and implement its recommendations. Moreover the UNFF's global membership would suggest high levels of consensus regarding the main challenges posed by current rates of deforestation, as well as an understanding of the major socio-economic benefits that can be realised through successful national, regional and international efforts to address these issues.

Legally-binding international agreements on the conservation of forests do exist, however their ratification relies upon their incorporation into law at the national level.[27] These include the UN Convention on Combating Desertification (UNCCD) adopted by 192 countries and the International Tropical Timber Agreement (ITTA) of which 60 countries have ratified.[28] Nonetheless, multiple arrangements on the issue have been reached or strengthened at the regional level. These include the Amazon Cooperation Treaty Organization (ACTO), instituted in 1995 to promote the integration of countries' rainforest territories into their national economies, as 'an essential condition for reconciling economic growth with environmental conservation'.[29]

Reducing Emissions from Deforestation and Forest Degradation (REDD)

Deforestation and forest degradation accounts for around 18-25% of global greenhouse gas emissions.[30] Deforestation is therefore directly linked to climate change, both in terms of threatening one of Earth's most important carbon sinks at the macro level, as well the role forests

[22] http://www.un.org/esa/forests/about-history.html
[23] http://www.un.org/esa/forests/pdf/ERes2007_40E.pdf
[24] http://www.fao.org/docrep/013/i1757e/i1757e.pdf (pp2-3)
[25] http://www.fao.org/docrep/013/i1757e/i1757e.pdf (p2)
[26] Jan L. McAlpine, 'Forests: Thinking and Acting outside the Box', in Biodiversity and Ecosystem Insecurity: A Planet cin Peril, Edited by Ahmed Djoghlaf and Felix Dodds, 2011: Earthscan, p.71.
[27] http://www.fao.org/docrep/013/i1757e/i1757e.pdf (p153)
[28] http://www.fao.org/docrep/013/i1757e/i1757e.pdf (p153)
[29] The State of Forests in the Amazon Basin, Congo Basin and Southeast Asia, FAO, 2011, p.39, p.40.
[30] Jan L. McAlpine, 'Forests: Thinking and Acting outside the Box', in Biodiversity and Ecosystem Insecurity: A Planet in Peril, Edited by Ahmed Djoghlaf and Felix Dodds, 2011: Earthscan, p.74.

play in mitigation at the micro level through the likes of flood prevention.[31] A concept recently developed to address these linkages is Reducing Emissions from Deforestation and forest Degradation (REDD). REDD seeks to address the drivers of deforestation and develop a greater appreciation of the crucial role forests play in climate change adaption and mitigation. It operates according to the idea that any country willing and able to reduce emissions from deforestation will be financially compensated for doing so.[32] Subsequent REDD+ programmes have attempted to promote and facilitate more sustainable forest management techniques, including conservation, afforestation, and the calculation of the monetary value of forests as carbon sinks. Nonetheless the guidelines and criteria for different REDD proposals vary significantly from one country to the next, as well as between governments and NGOs. Since REDD was first proposed by Papua New Guinea at the 2005 at Conference of the Parties to the Climate Change Convention (COP 11), its integration into the UN Framework Convention on Climate Change (UNFCCC) has proved complex, taking a two year process of deliberations for the COP to adopt a decision on the issue.[33] In this regard, despite the creation of a specific UN REDD initiative - launched in 2008 to assist developing countries prepare and implement REDD+ strategies - the funding, organisation and implementation of a fully operational international REDD mechanism continues to be negotiated under the UNFCCC.[34]

Billions of dollars have nonetheless already being pledged by numerous Northern governments and many REDD country programmes have commenced.[35] Tanzania, for example, has successfully completed various forest management and assessment training processes to reach the implementation phase of its $4.3million REDD+ programme, yet it remains to be seen whether this has had a sufficient impact on national institutions and practices to significantly reduce its rate of primary forest loss.[36] Evidence from other REDD countries emphasises the inability of REDD to successfully address the commercial drivers of deforestation and have therefore failed to reduce rates of forest loss.[37] Furthermore, REDD funds have in several cases been paid directly to global consultancy firms to devise national forestry strategies, such as McKinsey & Co, which has encouraged client governments such as the Guyana, Indonesia Papua New Guinea and the DRC to follow 'industry-oriented' development paths which have in the latter for instance legitimised increases in industrial logging and the use of forest lands for palm oil plantations.[38]

Systematic assessment of forest resources

In addition to assessing the extent of forest growth and depletion, organisations such as CIFOR and FAO have significantly enhanced the quality and scope of research into the condition and usage of woodlands across the globe. The World Resources Institute (WRI) Forest Landscapes Initiative also aims to use modern communications technologies such as satellites to better map the geo-spatial makeup of the world's largest forest areas to assist the planning and implementation of national forestry plans. This has included working directly with the DRC's Ministry of Environment, Nature Conservation and Tourism (MECNT) to provide both the state and non-governmental actors with the country's first comprehensive Interactive Forest Atlas.[39] Through its provision of reliable data, the Atlas can potentially have a major impact on sustainable forest management in the country. However its efficacy will ultimately remain limited

[31] http://www.millenniumassessment.org/documents/document.354.aspx.pdf, p.49
[32] The Little REDD+ Book, 2009, Global Canopy Programme , p.14.
[33] http://unfccc.int/methods_science/redd/items/4547.php
[34] http://www.un-redd.org/AboutUNREDDProgramme/FAQs/tabid/586/Default.aspx, p.7
[35] http://pdf.wri.org/climate_finance_pledges_2010-03-04.pdf
[36] UN-REDD Programme Year in Review report for 2010, p.5
[37] Bad Influence: How McKinsey-inspired plans lead to rainforest destruction, Greenpeace, 2011, p.v
[38] Bad Influence: How McKinsey-inspired plans lead to rainforest destruction, Greenpeace, 2011, p.v
[39] http://www.wri.org/publication/interactive-forest-atlas-democratic-republic-of-congo

unless the country's numerous drivers of deforestation such as conflict and corruption are also effectively addressed.

By 2001, however, FAO calculated that of the world's 137 countries, only 22 had assessment inventories able to deliver comparable data on an annual basis, 54 relied on a single inventory, 33 on a partial inventory, and 28 had no inventory at all.[40] This has begun to change markedly in the last decade however, with numerous countries now benefiting from National Forest Assessment (NFA) projects. In Vietnam, for instance, an NFA programme currently being finalised is set to play a central role in strengthening the state's capacity to undertake long-term monitoring programmes across a diverse range of forest are which will in turn directly shape its sustainable forestry strategy.[41] This includes the NFA being the country's principle Measurable, Reportable, and Verifiable (MRV) system for REDD.

With forests often transcending national boundaries, regional cooperation remains critical. Progress has varied between regions, largely due to political and geographical variations. In Europe for example, the International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP) continues to provide vital information for policy makers.[42] Integrated assessment of the vitality and human effects on the Amazon rainforest however - especially with regards to forest degradation more specifically - remains far more difficult due to its vast size and varying capacities of the countries which it spreads across.[43]

Remote sensing technologies have marked a major development in the systematic assessment of the world's forest resources. Programmes of this nature have become fully operational in several countries including Brazil, Canada, China, India, Japan, USA and the EU.[44] Other nations are also attempting to implement similar monitoring systems, yet in some of the countries with the greatest need for the transparent and reliable information on forest cover and condition - such as Indonesia - they remain absent or inadequate. [45] In countries where assessment capabilities are minimal due to lack of resources or poor systems of governance, non-state mechanisms have also emerged to play a vital role in analysis and the compilation of data on forest resources. In the Congo Basin for instance, the 2007 creation of the Observatory for Central African Forests (OFAC) has been central to advances in the collection, harmonization and dissemination of scientific, administrative and technical information on a wide range of forest issues.[46]

Recovering the full value of forests

Progress in methods of assessment have directly enabled governments to more accurately calculate the economic value of their wood and non-wood forest products (NWFP), considered by Agenda 21 to be a primary requisite for sustainable woodland management. Moreover, through identifying the full range of economic benefits from keeping forest areas intact, governments have been able to justify more sustainable forestry policies. It also provides incentives for actual forest managers and people both directly and indirectly depending on a certain forest on the ground to eschew damaging practices such as clear felling. Valuation studies prior to 1992 have in general been considered to be too academic, therefore much emphasis has been placed on ensuring that current initiatives are more oriented towards forest policy, management and

[40] http://www.fao.org/docrep/005/y4001e/Y4001E02.htm
[41] http://www.theredddesk.org/countries/vietnam/info/activity/national_assessment_and_long_term_monitoring_of_forests_and_tree_resources_in_vietnam
[42] http://www.icp-forests.org/
[43] The State of Forests in the Amazon Basin, Congo Basin and Southeast Asia, FAO, 2011, p.39.
[44] http://www.illegal-logging.info/approach.php?a_id=59; http://www.as.miami.edu/geography/research/climatology/SJTG2.pdf, p.25
[45] http://www.as.miami.edu/geography/research/climatology/SJTG2.pdf, p.15
[46] The State of Forests in the Amazon Basin, Congo Basin and Southeast Asia, FAO, 2011, p.45.

investment.[47] The Millennium Ecosystem Assessment has revealed that sustainably managed ecosystems can be up to 5 times more lucrative than intensive forestry and agricultural processes (see Figure 1).

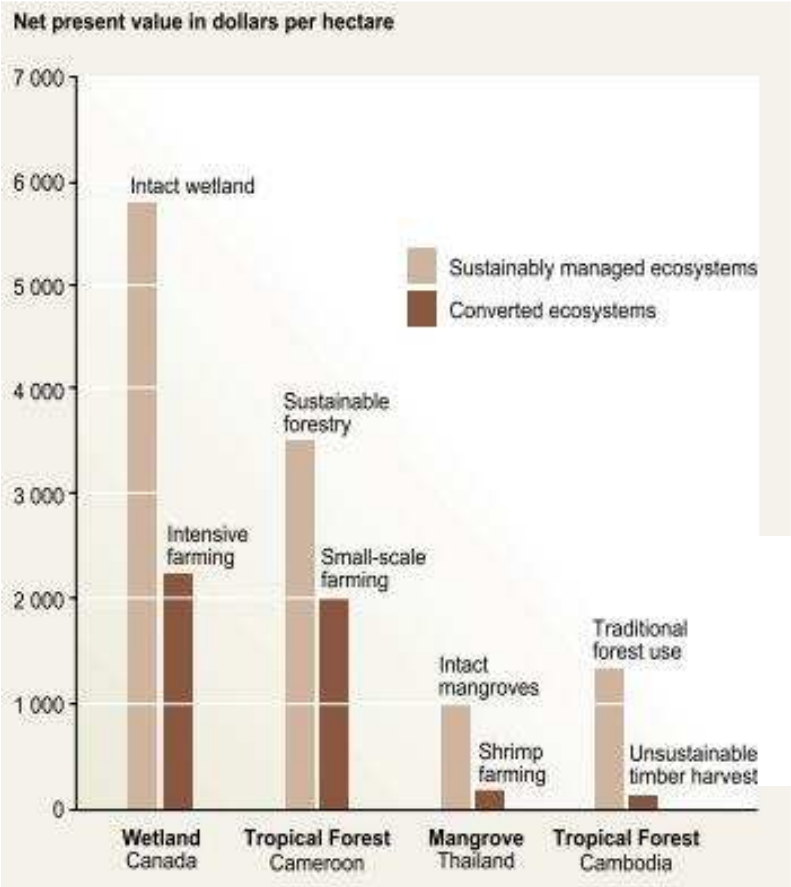

Figure 1. Economic benefits under alternative management practices
Source: http://www.millenniumassessment.org/documents/document.354.aspx.pdf, p. 39

In this respect, REDD has been particularly important in exhibiting to policy makers how estimated values of forest resources can be captured. Nonetheless, even when displayed to be more profitable in the long-term, many developing countries still struggle to resist using their forest resources to provide immediate economic gain, especially in the developing world where natural resources such as forests are the primary source of national income.

Sustainable Timber

The last decade has seen notable changes within the global timber industry, which despite still being a major contributor to deforestation has nonetheless in many cases altered its practices to become more sustainable. This can be attributed to the somewhat improved regulation of the sector at the national level and initiatives such as the Global Forest & Trade Network (GFTN), a WWF-led partnership created in 1991 just prior to the Earth Summit which aims to create a new market for environmentally responsible forest products and thereby eliminate illegal logging.[48] The network currently consists of approximately 300 companies, communities, and NGOs in

[47] ftp://ftp.fao.org/docrep/fao/003/W3641E/W3641E00.pdf, p.? (pdf page unavailable, html only)
[48] http://gftn.panda.org/about_gftn/

more than 30 countries around the globe.[49] Through directly supporting forest managers and resource users to earn Forestry Stewardship Council (FSC) certification, it claims to have helped define and implement the sustainable ideals of 'traceability, verification, chain of custody and due diligence' upon which combating deforestation depend.[50] However the GFTN has recently been criticised on a number of fronts, including a lack of transparency and accountability, inadequate rules for membership, and insufficient procedures to ascertain if the scheme has actually had a positive contribution to combating deforestation.[51] Moreover a number of its members have been revealed to be continuing practices such as the clear felling of endangered species' habitat, the supply of illegal timber and working with subsidiaries contributing to conflicts in nations such as the DRC, thereby severely undermining the initiative's impact.[52]

FSC certification is itself a consumer initiative which has facilitated a marked increase in the use of selective logging techniques and a greater reliance on newly planted forest/afforested areas. By 2011, 257 forest management units (both natural forest and plantations) with a total of 17.7 million hectares in the sub-/tropics are managed according to the FSC standards.[53] Nonetheless, with most certified forests being in the North, managed by large companies and exporting to Northern retailers, certification processes have had a far less significant impact on the protection of tropical forests where the highest rates of deforestation continue to occur.[54] In addition, the proliferation of certification programmes to meet the needs of a wide range of stakeholders has meant that no single initiative has emerged as the most credible or dominant approach globally. [55]

More specific, however, are recent attempts led by Northern states and intergovernmental associations to end the illegal timber trade. Primary amongst these is the EU's Forest Law Enforcement Governance and Trade (FLEGT) initiative, launched in 2003, which has sought to prevent the passage of illegal timber to the continent through creating tailor-made Voluntary Partnership Agreements (VPAs) between itself and numerous timber exporting nations. [56] VPAs aim to stimulate sustainable forestry management practices through strengthening land tenure and access rights, increasing stakeholder participation, and provide direct access to European timber markets.[57] Independent analysis has revealed positive impacts in producer countries through the enhancement of stakeholder's rights in forest governance, however the VPAs nonetheless appear to lack social safeguards for those engaged in the informal forestry sector that will lose their livelihoods if its regulations are strictly enforced.[58] Outside of the EU, public procurement legislation has also been introduced in Switzerland, Norway, Japan, Australia and New Zealand as well as in the Brazilian state of Rio Grande in 2010, which if implemented and enforced effectively stands to have a major impact on reducing rates of illegal deforestation.[59]

Domestic action

The success of national policies to effectively combat deforestation – as well as the capacity for their formulation in the first place – has been very much dependent on the effectiveness of governance structures and state institutions. The number of forestry education and training

[49] http://www.wwf.org.uk/wwf_articles.cfm?unewsid=5136;
[50] http://gftn.panda.org/resources/reports/?201967/GFTN-20th-Anniversary-Report, p.8
[51] http://www.globalwitness.org/sites/default/files/pdfs/Pandering_to_the_loggers.pdf, p.3
[52] http://www.globalwitness.org/sites/default/files/pdfs/Pandering_to_the_loggers.pdf, p.3
[53] http://www.fsc.org/fileadmin/web-data/public/document_center/powerpoints_graphs/facts_figures/2011-09-15-Global-FSC-Certificates-EN.pdf, p.13
[54] http://www.millenniumassessment.org/documents/document.354.aspx.pdf, p.72.
[55] http://www.millenniumassessment.org/documents/document.354.aspx.pdf, p.72.
[56] http://www.illegal-logging.info/uploads/Proforest2010marketrequirementsforlegaltimber.pdf, p.vii
[57] http://www.fnp.wur.nl/NR/rdonlyres/797B3539-C360-4F5A-BB8E-80A0267B8129/135880/FLEGTimpactlocalpeople.pdf, p.5
[58] http://www.fnp.wur.nl/NR/rdonlyres/797B3539-C360-4F5A-BB8E-80A0267B8129/135880/FLEGTimpactlocalpeople.pdf, p.4
[59] http://www.illegal-logging.info/uploads/Proforest2010marketrequirementsforlegaltimber.pdf, p.21; http://www.illegal-logging.info/item_single.php?it_id=4696&it=news

programmes has in general failed to increase significantly over the past decades. Their quality and impact both remain mixed, with some of the world's largest forests still lacking adequate education and vocational capacities. In the Amazon region, for example, despite the creation of a Latin American Network of Forest Education (RELAFOR), which promotes regional collaboration between forestry education facilities to further research and training in the field, the overall student numbers are declining and public awareness of the vital role this industry must play in the sustainable management of this resource remains low.[60] In the Congo basin, knowledge of forest ecosystems remains poor, and a distinct lack of intra-sectoral coordination presides, seeing considerable inconsistencies between forest policies and laws on the one hand, and those of other sectors which have an impact on deforestation and forest degradation on the other.[61] In Southeast Asia, most countries have seen little measurable improvement in standards of forestry governance despite an increased focus on forest law enforcement (Indonesia remains a notable exception), owing largely to insufficient resources, vested business interests and uncertainties over land tenure. [62]

The last two decades have seen many forest-rich countries exhibit a shift from cumbersome and costly state-centred approaches of natural resource management (NRM) towards methods in which local forest peoples and smallholders play a far more active role, with the former often gaining formal employment as a consequence.[63] Communities have in turn experienced benefits such as a share of revenues from timber and NWFP sales, with a Honduran cooperative initiative proving particularly successful; tourism activities, which have been lucrative for many local groups in Botswana and Namibia; and infrastructural development, which has been significant in rural Mexico.[64] Yet many cases of 'devolved' NRM have been greater in rhetoric than substance, with central government authorities such as India's Forest Department continuing to exert considerable control over - and reap the financial rewards from – locally worked forest resources, therefore lacking a genuine shift in authority and reward to local people.[65]

Similarly, the decentralisation of decision making and tenure to local government authorities has been able to foster more effective forest management in some instances, yet remains highly dependent upon the effectiveness of local institutions and has therefore had catastrophic consequences in others. Positive instances have often divided and integrated considerable portions of forest land according to their specific functions, thus enabling local forest managers to balance multiple interests and priorities. In the Philippines 37% of public forests have been devolved to approximately 6,000 local groups through various community management agreements and in Viet Nam approximately 21% of forests are under community administration.[66] The granting of individuals, families and indigenous groups with land rights has proved a particularly efficacious exercise, resulting in considerably increased rates of afforestation and an important source of local economic development.[67] In Indonesia, however, similar attempts have suffered from the competing nature of central and local government agencies, with the initiative itself failing to provide clear guidance for local communities or distribute the benefits between working partners equitably, therefore failing to avert the continuation of unsustainable forest resource use.[68]

[60] The State of Forests in the Amazon Basin, Congo Basin and Southeast Asia, FAO, 2011, pp.39, 41.
[61] The State of Forests in the Amazon Basin, Congo Basin and Southeast Asia, FAO, 2011, p.42.
[62] The State of Forests in the Amazon Basin, Congo Basin and Southeast Asia, FAO, 2011, p.48.
[63] http://www.odi.org.uk/resources/download/2068.pdf, pp.1-2
[64] http://www.fao.org/DOCREP/006/U9040E/U9040E13.htm; http://www.odi.org.uk/resources/download/2068.pdf, pp.1-2
[65] http://www.odi.org.uk/resources/download/2068.pdf, p.1
[66] http://www.communityforestryinternational.org/publications/articles/Cambodias_Forests_and_Climate_Change.pdf, p.286
[67] The State of Forests in the Amazon Basin, Congo Basin and Southeast Asia, FAO, 2011, p.48.
[68] http://www.cifor.org/publications/pdf_files/Books/Decentralisation-Case12.pdf, p.40.

At a legal level, several countries have promulgated ancestral land laws in which indigenous and forest-dependent communities that have experienced centuries of marginalization are beginning to see their forest rights recognised.[69] Similarly, some nations have sought to constitutionally guarantee the protection of domestic forest lands. This includes India, where the Forest Conservation Act was recently amended to stipulate that any conversion of forest lands to non-forest uses must be both approved and managed by the central government.[70] This legal framework thus enables far greater regulation of the use of the country's forest resources. Yet this inevitably is dependent upon the existence of sufficient incentives for the government to act in a sustainable manner, leaving the protection of national forest resources contingent upon the discretional policies of decision makers; themselves constrained by the effectiveness of domestic institutions and governance structures. There are also criticisms claiming that the act significantly slows down development at the local level, once again exhibiting the difficultly in balancing forest conservation efforts with economic growth.[71]

Payment for Ecosystem Services

A more recent approach to combating deforestation has been Payment for Ecosystem Services (PES), in which land owners are offered financial incentives for preserving forests due to the ecological value they provide 'households, communities and economies'.[72] 'Forest carbon' is of course an ecosystem service, therefore many REDD+ initiatives are examples of an international PES mechanism. At the national level, however, PES programmes based on the role of forests in the maintenance of watersheds and the protection of biological diversity have had positive impacts on deforestation in many Latin American countries and China.[73] A national PES system has perhaps been most successful in Costa Rica, which prior to 1992 had one of the highest rates of deforestation globally, however the establishment of an innovative national PES programme later that decade has been a major contributor to a dramatic reduction in forest loss.[74] This has involved a direct shift in economic focus from agriculture to ecotourism – something which larger countries have struggles to replicate. Moreover the successful implementation of this programme has been dependent on various other structural conditions including amongst others political stability, high investment in education and agricultural reform. The absence of these conditions in many other developing forest rich nations would appear to be a major reason for absence of effective woodland related PES programmes.

Challenges and Conflicts

Addressing the drivers of deforestation

The primary obstacles still to be overcome are both numerous and overlapping. Whilst not all deforestation is intentional, with some caused by a combination of human and natural factors such as wildfires and subsequent overgrazing which can prevent the growth of young trees, the vast majority occurs for primarily economic reasons.[75] At the national level, many governments still lack the ability to measure and describe the full value forest assets vis-à-vis their long term contribution to socio-economic development, and are therefore failing to allocate resources and implement policies safeguarding their protection. Very few countries have effectively addressed the drivers of deforestation at both the macro *and* micro levels, often failing to recognise the need for those managing and residing in and around forest lands to actually experience the monetary

[69] http://www.communityforestryinternational.org/publications/articles/Cambodias_Forests_and_Climate_Change.pdf, p.286
[70] Forest Law and Sustainable Development – World Bank, 2007, p.35.
[71] Forest Law and Sustainable Development – World Bank, 2007, p.35.
[72] http://www.rff.org/Documents/RFF-DP-06-02.pdf, p.1
[73] http://www.odi.org.uk/resources/download/560.pdf, p.5
[74] http://www.developmentprogress.org/sites/default/files/costa_rica_web_master.pdf, p.2
[75] http://environment.nationalgeographic.com/environment/global-warming/deforestation-overview/

value of sustainable forest use. Nations with the highest rates of deforestation such as Brazil, DRC and Indonesia also possess the largest number of people dependent upon forests for their livelihoods.[76] Unless presented with alternative options for income generation, forest communities will continue to engage in unsustainable practices which provide greater immediate financial benefit. These include removal of the most valuable species of wood without any plans for regeneration thereby causing rapid degradation, the concentration of forest management on fast growing species which cannot support the levels of biodiversity and ecosystems services primary forests do, and hiring cheap, exploited labour who do not have the ability or inclination to engage in sustainable forestry.

Agricultural pressures

The biggest driver of deforestation is agriculture, clearing woodland to provide more room for planting crops or grazing livestock. Small subsistence farmers throughout the world continue to collectively clear sizeable areas of forest to feed their families by felling and burning trees – a process known as "slash and burn" agriculture. However it is industrial scale agriculture - something which has been particularly prominent in the primary forests of Brazil and Indonesia over the past two decades - which now has a much greater impact on rates of deforestation than the forestry industry itself.[77] For many Latin American countries, the highest rates of Amazon deforestation in the 1990s coincided with a peak in the price of agricultural products.[78]

Deforestation is therefore also inexorably linked to the incremental rise in global demand for food, especially in major emerging economies with rapidly expanding rates of population. Northern consumption trends are also highly influential, with woodland being replaced with soya and other similar crops to produce feed for livestock to be consumed primarily in the developed world. The agricultural challenge is also heightened by the increasing demand for biofuels, driven by legislation in Northern countries aiming to reduce their dependency on fossil fuels.[79] The economic incentives for using forest lands for agriculture therefore seemingly outweigh those of conservation. Indonesia, for example, has invested significantly in lucrative agricultural practices such as palm oil production which are a major contributing factor to the rapid destruction of its primary forests. The most persistent difficulties in the implementation of the Chapter's strategies at the national level can therefore be directly attributed to political short-termism and a reluctance of governments to compromise ephemeral economic growth.

Weak national laws and institutions

Forest law enforcement programs have been debated in many countries, but not fully implemented. Both the creation and enactment of forest law remains highly complex because of its highly cross-cutting characteristics and the challenges of balancing multiple state and non-state interests.[80] This is further hindered by weak legal institutions and enforcement mechanisms which prevail in many developing countries such as the DRC, as well in the more remote regions of the Amazon basin. Similarly, many countries also lack institutionalised mechanisms to ensure that forestry issues are considered when formulating legislation on agriculture, energy and any other cross cutting policy areas.[81] Furthermore, if governments in developing countries are unable to mainstream more sustainable policies and incentivise environmentally sound practices in a coordinated fashion across all decision making and business structures, then the effects of

[76] http://www.fao.org/docrep/014/i2247e/i2247e00.pdf, pp.11-12
[77] Jan L. McAlpine, 'Forests: Thinking and Acting outside the Box', in Biodiversity and Ecosystem Insecurity: A Planet in Peril, Edited by Ahmed Djoghlaf and Felix Dodds, 2011: Earthscan, p.75.
[78] Jan L. McAlpine, 'Forests: Thinking and Acting outside the Box', in Biodiversity and Ecosystem Insecurity: A Planet in Peril, Edited by Ahmed Djoghlaf and Felix Dodds, 2011: Earthscan, p.74.
[79] http://ec.europa.eu/energy/renewables/biofuels/sustainability_criteria_en.htm
[80] Forest Law and Sustainable Development – World Bank, 2007, p.xi.
[81] The State of Forests in the Amazon Basin, Congo Basin and Southeast Asia, FAO, 2011, p.39.

initiatives such as REDD will remain severely limited.[82] There are also currently insufficient greenhouse gas inventories and assessment systems to collect and collate accurate data on the use of forest lands in many developing countries for REDD schemes to function as intended.[83]
Whilst virtually all countries now have national forest programmes in place, legitimate doubts still exist around their effectiveness.[84] This is true for all types of woodland, but especially tropical forest, of which less than 5% are being managed sustainably' according to the World Bank.[85] Southern nations continue to suffer from high levels of corruption in the allocation and administration of their forest resources, as well as – despite the aforementioned improvements - continuing to experience substantial rates of illegal logging. Moreover, poor governance and the corruption which it breeds makes the implementation of REDD and other forest management programmes almost impossible. Moreover, it is often countries with the weakest institutions that are in most urgent need assistance to combat deforestation, such as the Democratic Republic of Congo (DRC), home of the world's second largest tropical forest but also suffers from immense political instability and high levels of social deprivation.

There is also often a missing link between forest research and forest management. Forest managers, especially those in more remote regions usually do not know about recent research outcomes, with national institutions to bridge this communication and training gap generally lacking or inadequate. Even when these mechanisms are put in place, a challenge remains in balancing divergent research outcomes such those with ecology based recommendations emphasising conservation, against more industry-oriented policies promoting the intensive use of certain species – while minimizing diversity - to maximize income in an industry demanding increasingly homogenous products.

The challenges and risks of decentralisation
The decentralisation of sustainable forest management is also an immensely tricky process which if carried out poorly can have major implications for the wellbeing of forests as well as those who depend upon them. In the Amazon basin, most forest area is publicly owned, however regional and local forestry agencies tend to lack both the financial and human resources to uphold forestry laws and maintain jurisdictional control - the difficulty of which is significantly heightened by its vast size – therefore national management strategies have prevailed despite their inability to control primary forest loss.[86] Similarly, NRM strategies which attempt to devolve forest governance to local communities have consistently failed to halt practices of primary forest destruction and degradation due to the negative trade-offs often experienced by local - and usually the poorest - people. In many cases, it is the actors already dominant at the community level which are able to manipulate devolution processes to suit their own individual interests, therefore severely limiting the social and financial benefits to the poorest sectors.[87] Furthermore in India, China and the Philippines, the timber and agroforestry species favoured by forestry departments were usually promoted at the expense of those able to provide poor and indigenous peoples with medicine, fuels and wild foods.[88] This once again displays the prevailing tension in many countries between the use of forests for commercial and social purposes.

[82] http://www.communityforestryinternational.org/publications/articles/Cambodias_Forests_and_Climate_Change.pdf, p.286
[83] The Little REDD+ Book, 2009, Global Canopy Programme , p.122.
[84] http://www.earthsummit2002.org/es/preparations/global/Microsoft%20Word%20-%20SG%20report.pdf p.27
[85] Forest Sourcebook: Practical Guidance for Sustaining Forests in Development Cooperation, World Bank, 2008, p.30
[86] The State of Forests in the Amazon Basin, Congo Basin and Southeast Asia, FAO, 2011, p.39.
[87] http://www.odi.org.uk/resources/download/2068.pdf, p.2
[88] http://www.odi.org.uk/resources/download/2068.pdf, p.2

The timber trade and illegal forestry activities

Activities of the logging industry, both legal and illegal, continue to pose a major challenge to combating deforestation. To access and extract resources from primary forests, both state and private logging necessitates the building of transportation infrastructure which increases access to more remote areas, thereby facilitating further deforestation. In many developing countries illegal logging and associated trade in illegally sourced forest products remain an important cause of deforestation and forest degradation.[89] These practices not only accelerate the destruction of forests and the diverse ecosystems which they house, but also foster corruption, conflict and channel revenue away from national development efforts at the local level, often leaving communities dependent on illegal forestry activities for their income. In addition, the attention of both NGOs and the global media has now also shifted from illegal logging to climate change, which despite the two being inexorably linked, has severe implications for the funding and implementation of effective anti-illegal extraction campaigns.[90]

Attempts to break such cycles through the ratification of domestic forestry laws remain challenged by their need to blend environmental protection with legitimate resource extraction whilst taking into account myriad international obligations such as those pertaining to trade, human and indigenous rights, and timber certification for example.[91] In the Congo Basin, for example, in which one of the dominant drivers of deforestation is illegal or unsustainable firewood extraction and charcoal production – thereby essentially socio-economic in nature - and so cannot be controlled simply through intra-sectoral actions.[92] In Brazil, despite significant progress made in the last decade, in 2008 WWF estimated that between 50-70% of the country's timber is still sourced illegally.[93] Brazil has nonetheless since made notable improvements in the transparency of its timber industry, implemented more robust systems for managing harvest rights and tracking the moment of removed wood.[94] However this has not been matched by most other countries, with Indonesia and Malaysia in particular still deficient in many of these mechanisms which remain central to the prevention of illegal logging.[95] Problems with forest law enforcement also remain widespread despite most countries already having reasonably dissuasive maximum penalties in place. Again in Brazil, for example, fines handed out for illegal forestry activities increased eightfold between 2003 and 2007, yet only 2.5% have been successfully recuperated.[96]

Inadequate international financial and technical assistance

The current levels of financial support for developing countries from the international community would still appear to be inadequate. Funding remains sporadic and focused on singular issues, rather than being channelled through more integrated programmes that could be potentially administered by a more effective global forest regulatory body. The emergence of the Global Environment Facility (GEF), for example, as a necessary financial instrument to facilitate the implementation of Agenda 21, has made significant monetary contributions to national sustainable forest management programmes. However this support is primarily focused on the protection of biodiversity within forests and is therefore alone insufficient to meet the wider

[89] Illegal Logging and Related Trade: Indicators of the Global Response, Sam Lawson and Larry MacFaul, Chatham House, 2010, p.xiii

[90] Illegal Logging and Related Trade: Indicators of the Global Response, Sam Lawson and Larry MacFaul, Chatham House, 2010, p.xiii

[91] Forest Law and Sustainable Development – World Bank, 2007, p.xi.

[92] The State of Forests in the Amazon Basin, Congo Basin and Southeast Asia, FAO, 2011, p.42.

[93] http://bolivia.panda.org/nuestro_trabajo/programa_forestal/comercio_forestal_responsable/noticias/?uNewsID=194293

[94] Illegal Logging and Related Trade: Indicators of the Global Response, Sam Lawson and Larry MacFaul, Chatham House, 2010, p.xiii

[95] Illegal Logging and Related Trade: Indicators of the Global Response, Sam Lawson and Larry MacFaul, Chatham House, 2010, p.xiii

[96] Illegal Logging and Related Trade: Indicators of the Global Response, Sam Lawson and Larry MacFaul, Chatham House, 2010, p.xiii

financial needs of Southern governments to implement effective broader re-/afforestation programmes.[97]

The majority of funding channelled to developing countries to combat deforestation in recent years has been through various individual REDD+ programmes. Nevertheless, the absence of a consensus on how to organise and finance a functioning international REDD mechanism continues to severely limit these scope of initiatives.[98] Until a more conclusive agreement is reached as to how REDD should be funded, market based or a mixture of the two, developing countries will fail to receive adequate funding to develop the range of institutions necessary for sustainable forest management. Furthermore, this inconclusiveness makes the allocation of funds through REDD harder to prioritise; a process complicated further by poor governance, corruption and the vested interests of both state and non-state donors.

Way Forward

Forests will always be a fundamental and multifaceted component of the global ecosystem, providing much of the world's food, water, fuel and employment. Failure of the international community, national governments and local stakeholders to collectively engage in a more cooperative, committed and wider reaching campaign to significantly reduce rates of deforestation will result in consequences that extend far beyond this single issue. The causes of deforestation are multiple and complex therefore there is no single global blueprint to address the issue - what exists, rather, are a wide range of tools which must be individually tuned according to regional, national and international realities in order to create legal frameworks and socio-economic environments conducive to long-term responsible forest management. Whilst clear steps in the right direction have been made at both the international and national levels, considerable efforts are still required to ensure that all countries, authorities and forest depending societies are sustainably managing woodland resources to meet the social, economic, ecological, cultural and spiritual needs of present and future generations'.[99]

Greater international collaboration and commitment

The UNFF is tasked with the highly complex process of increasing collaborations between the separate environmental, social and economic institutions from which the many, often disparate international and regional agreements on deforestation originate. Despite enjoying universal membership, this is an immensely difficult charge and could directly benefit from greater resources. Northern countries must not only increase their levels of financial and technical support to developing nations, they must also ensure that this assistance supports the multiple uses of forests and not just as a mechanism for carbon sequestration. This could to occur within the context of a new legal framework at the international level, guaranteeing the rates and time-frame of North-South assistance, as well as an increase in both the pressures and incentives for governments to engage in sustainable use of their forest resources. Rates of tropical deforestation would also benefit from reduced hardwood consumption in Northern countries, something which governments and unions could attempt through taxation structures which reflect the full cost/value of their removal.

Attempts to tackle the agricultural drivers of deforestation could benefit from addressing existing trade regulations made under the General Agreement on Tariffs and Trade (GATT) process, which currently increase market access to forest resources without ensuring that they are

[97] http://www.fao.org/forestry/7077/en/
[98] The Little REDD+ Book, 2009, Global Canopy Programme , p.122.
[99] http://www.un.org/documents/ga/conf151/aconf15126-3annex3.htm

protected from excessive market pressures.[100] This responsibility is instead placed on governments, therefore those states with weak regulatory institutions that struggle to enforce sustainable forestry practices would directly benefit from greater protection from global trade agreements.[101] Current proposals for Asia-Pacific Economic Cooperation (APEC) countries to further reduce tariffs for wood and paper products should therefore be opposed by the likes of Indonesia and Malaysia who lack the regulatory capacities to ensure that the investments this would facilitate would be of a sustainable nature.[102]

The future of REDD and other international PES mechanisms

International PES initiates have considerable potential for incentivising sustainable forest management, conservation and economic development. They should nonetheless not be considered a panacea but rather compliment non-market based approaches to combating deforestation.[103] Both donor and recipient governments must work collaboratively to secure certain institutional arrangements upon which effective PES mechanisms will depend. These include legal, social and economic frameworks which provide secure land tenure, pro-poor access and transparent monitoring arrangements, thereby reducing risk for ecosystem service buyer and optimising stakeholder participation.[104]

To achieve a fully operational REDD mechanism, therefore, governments in the South must be provided with greater assistance to implement accurate monitoring, reporting and verification mechanism to collect consistent data on their greenhouse gas emissions and use of forest resources which is consistent and comparable across developing countries.[105] In practice, this will require a hybrid approach in which local drivers of deforestation are addressed and acted upon in collaboration with local communities, with national drivers being mitigated through policies necessitating strong partnerships between diverse institutions.[106]

Conflict/post-conflict countries like the DRC must develop their capacities in law enforcement and financial regulation in particular. Moreover, it is essential that the 'basic building blocks' for a robust REDD mechanism are put in place in every nation for it to become a useful tool in combating deforestation and reducing CO2 emissions. In addition, an effective new REDD mechanisms will also need to be flexible and able to evolve with both changing national and international circumstances over time.[107] An international consensus on how REDD should be funded must be also be reached, regarding both the source and levels of finance. Irrespective of this of this however, capital allocated to REDD should not simply focus on the carbon sequestration potential of forests to offset emissions from developed countries, it should rather facilitate a holistic range of sustainable forest management processes.

Building national and local capacity

The ability of low-income governments to create an environment in which stakeholders eschew the short-term competitive advantage achieved from the exploitation of their forest resources can be bolstered by sustained international support for institutional capacity building, with the areas of education and training remaining of primary importance. This will enable Southern government to invest more resources in the provision of basic education programmes which emphasise the local, national and international benefits of keeping primary woodlands intact for

[100] http://escholarship.org/uc/item/9rn062fj.pdf, p.1.
[101] http://escholarship.org/uc/item/9rn062fj.pdf, p.1.
[102] Sierra Club, Friends of the Earth and Greenpeace, quoted in: http://rainforestinfo.org.au/wrr38/ttrade.htm
[103] http://www.odi.org.uk/resources/download/560.pdf, p.1
[104] http://www.odi.org.uk/resources/download/560.pdf, p.1
[105] The Little REDD+ Book, 2009, Global Canopy Programme , p.122.
[106] http://www.communityforestryinternational.org/publications/articles/Cambodias_Forests_and_Climate_Change.pdf, p.287
[107] The Little REDD+ Book, 2009, Global Canopy Programme , p.123.

all communities living and working in or around forest lands. They must also improve the quality of and access to more advanced training programmes on sustainable forest management – something which would greatly benefit from further North-South technical assistance. These programmes should also involve local stakeholder participation in both their planning and implementation to ensure that the social and economic needs and interests of specific forest communities are not overlooked.[108]

At the macro level, the global expansion of new satellite imagery and forest mapping techniques - bolstered by the heightened accessibility high speed internet brings - has the potential to 'usher in a new era of global transparency in the forestry sector'.[109] These tools and data are of primary importance to large forest management schemes, but can also play an important role in local forest governance through better educating communities about the wider implications of their forestry practices as well as emphasising the scale of the deforestation problem in their locality and nation more generally. Nonetheless more work is still needed on the development of international monitoring standards and methods, which currently vary greatly from one project to the next, as well as developing communications infrastructure in rural areas to enable access to this data.[110]

Improving forest resource governance

Because the economic costs of the depletion and degradation of forests and the ecosystem services they constitute are poorly reflected in conventional indicators of growth or prosperity, it is crucial for governments to measure and implement policies according to the full value of their forest resources.[111] Moreover the clear felling of vast areas of forest may contribute to an increase in GDP in the short term, however this removes a valuable long-term source of economic and social capital. Because the sustainable use of natural forests provide greater employment opportunities and ecosystem services than the majority of re/afforested areas of the same size, decision makers at all levels should prioritise their protection and eschew forestry programmes which claim to legitimise primary forest loss through the creation of plantations of homogenous tree species.

The local drivers of deforestation can be limited most effectively by ensuring sustainable forestry provides sufficient social, economic and cultural benefit for forest peoples. This can be achieved through greater devolution of forest resource governance to communities and regional authorities, however it is important to note that states, local populations and other stakeholders each have different visions of devolution and its mode of implementation, therefore an emphasis should be placed on widespread consultation.[112] Management policies can benefit from fitting around existing structures of resource ownership providing they are relatively equitable and democratically organised – something which NGOs in particular can play an important role in developing.[113] In instances where new land tenure systems are necessary to engage disadvantaged resource users, they must be context-specific and strictly enforced to prevent their manipulation by unsustainable and opportunistic practices and business interests.[114]

FLEGT, for example, has been conducive to the creation of better economic incentives for some stakeholders, but in its current form lacks the benefit sharing and social safeguards for the large

[108] http://www.cbd.int/development/doc/cbd-good-practice-guide-forestry-booklet-web-en.pdf, p.35
[109] http://www.as.miami.edu/geography/research/climatology/SJTG2.pdf, p.25
[110] http://www.as.miami.edu/geography/research/climatology/SJTG2.pdf, p.25
[111] http://www.millenniumassessment.org/documents/document.354.aspx.pdf, p.38
[112] http://www.odi.org.uk/resources/download/2068.pdf, p.1
[113] http://www.millenniumassessment.org/documents/document.354.aspx.pdf, p.72; http://www.odi.org.uk/resources/download/2068.pdf, p.1
[114] http://www.millenniumassessment.org/documents/document.354.aspx.pdf, p.72.

numbers of groups in the informal timber sector. It would perhaps be more effective, therefore, if it placed greater emphasis on structural innovations which focus on equitable rights within the forestry sector, through providing clear incentives for communities involved in illegal timber cutting to develop alternative sustainable income generating activities.[115]

However decentralisation is not necessarily always the best option and for some developing countries which lack the capacity to develop the national and local institutions upon which sustainable community-led forest management depend as it may pose unnecessary risks in the short-term. Moreover a single large forest management unit can still halt deforestation providing it meets certain criteria. These include substantial financial and human resources; bringing timber and NWFPs into local and national economies; providing space for tourism; and working closely with and utilising the knowledge of communities which depend upon forests for their livelihoods and culture to ensure that their needs for food, fuel and employment are met.[116] This will in turn require managers to provide adequate training facilities, as well as ensure that forest peoples receive fair payment for sustainably collected timber, NWFPs and other environmental services.

Further development of voluntary certification

While by no means a panacea, the further expansion – especially in the tropical forests of the South - and possible harmonisation of disparate voluntary certification schemes could help all stakeholders recover greater value from sustainably managed forests.[117] This will nonetheless depend upon these initiatives increasing their transparency, inclusivity and sustainability standards, including more rigorous, regular and independent field and office audits and evaluations.

[115] http://www.fnp.wur.nl/NR/rdonlyres/797B3539-C360-4F5A-BB8E-80A0267B8129/135880/FLEGTimpactlocalpeople.pdf, p.18
[116] http://www.cbd.int/development/doc/cbd-good-practice-guide-forestry-booklet-web-en.pdf, p.18
[117] http://www.cbd.int/development/doc/cbd-good-practice-guide-forestry-booklet-web-en.pdf, p.12

Chapter 12: Managing Fragile Ecosystems: Desertification and Drought

Introduction

Chapter 12 of Agenda 21 – 'Managing Fragile Ecosystems: Combating Desertification and Drought' - addresses land resource issues in deserts, arid, semi-arid and dry sub-humid areas - areas which are collectively named drylands. Drylands include all terrestrial areas where ecosystem provisioning services - for example, crop production - are limited as a result of water scarcity[1]. Whilst the five programmes areas[2] in this Chapter focus on the issues of desertification and drought, it is important to recognise and consider linkages to other issues – such as, agricultural sustainability, rural development and resource management – and additional chapters within Agenda 21 – namely, chapters 10 and 14.

Desertification is defined as, "land degradation in arid, semiarid and dry sub-humid areas resulting from various factors, including climatic variations and human activities"[3]. Land degradation is defined as, "the reduction or loss of the biological or economic productivity of drylands"[4]. Desertification has economic, environmental and social implications at the local, national, regional and global scales[5]. In addition, it holds significant links with rural poverty and food insecurity, influencing conditions that lead to migration, famine, political instability and conflict. Desertification affects and is affected by global trends including increases in human population, climate change, and natural disasters. Combating desertification would have significant implications for addressing other inter-related global challenges, and therefore, for achieving sustainable development[6].

Drought is "a natural phenomenon that occurs when rainfall is significantly below normal recorded levels over a long period of time"[7]. Droughts exacerbate the issue of desertification, heightening its threat for millions of dryland people. Climate change is expected to intensify the incidence and severity of drought, thus further exacerbating desertification[8].

[1]Millennium Ecosystem Assessment (MEA) (2005) Ecosystems and Human Wellbeing : Desertification Synthesis Report, p1 http://www.maweb.org/documents/document.355.aspx.pdf

[2]The five programme areas within Chapter 12 of Agenda 21 are: (a) Strengthening the knowledge base and developing information and monitoring systems for regions prone to desertification and drought, including the economic and social aspects of these ecosystems; (b) Combating land degradation through, inter alia, intensified soil conservation, afforestation and reforestation activities; (c) Developing and strengthening integrated development programmes for the eradication of poverty and promotion of alternative livelihood systems in areas prone to desertification; (d) Developing comprehensive anti-desertification programmes and integrating them into national development plans and national environmental planning; (e) Developing comprehensive drought preparedness and drought-relief schemes, including self-help arrangements, for drought-prone areas and designing programmes to cope with environmental refugees; (f) Encouraging and promoting popular participation and environmental education, focusing on desertification control and management of the effects of drought

[3]United Nations Convention to Combat Desertification (UNCCD) http://www.unccd.int [accessed 25/05/2011]

[4]Millennium Ecosystem Assessment (MEA) (2005) Ecosystems and Human Wellbeing : Desertification Synthesis Report, p1 http://www.maweb.org/documents/document.355.aspx.pdf

[5]United Nations Economic and Social Council (2008) Review of implementation of Agenda 21 and the Johannesburg Plan of Implementation: Desertification http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/235/48/PDF/N0823548.pdf?OpenElement

[6]Policy options and actions for expediting progress in implementation: Desertification http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/651/95/PDF/N0865195.pdf?OpenElement

[7]United Nations Convention to Combat Desertification (UNCCD) [accessed 25/05/2011]

[8]United Nations Economic and Social Council (2008) Review of implementation of Agenda 21 and the Johannesburg Plan of Implementation: Drought http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/229/51/PDF/N0822951.pdf?OpenElement p 6

Implementation

41.3 percent of the Earth's total land surface is dryland, covering 6 billion hectares. At present, over two billion people inhabit ecosystems in dryland areas, with 87-93 percent[9] of these living within developing countries[10]. A significant proportion of the dryland populations' livelihoods are dependent upon crop and livestock production – with 25 percent of drylands supporting cultivation and 65 percent of drylands constituting as rangeland. Dryland rangeland supports half of the global stock of livestock[11].

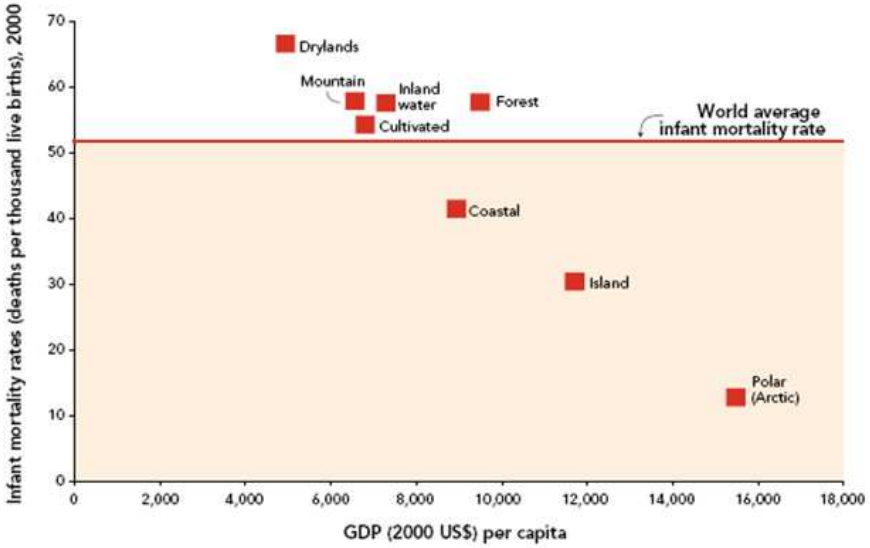

Figure 1. Millennuim Ecosystem Assessment area categories, GDP per capita, and infant mortality rates

Source: UNDESA, Trends in Sustainable Development, 2008:27, from MEA, 2005.

Drylands suffer from the highest levels of infant mortality and the lowest GDP per capita (figure 1). With such high levels of poverty and a strong dependence upon drylands for livelihoods, dryland populations are particularly exposed to the impacts of desertification and the deterioration of ecosystem services[12].

Over 30 percent of the Earth's drylands are contained within North Africa, the Sahel and the southern regions of Africa. These drylands are home to more than 400 million people, with the greater part of them belonging to the rural poor. African drylands are particularly vulnerable to the effects of soil erosion, nutrient mining, deforestation, climate change, and persistent and

[9]This variation is dependent on the categorization of the former Soviet Union countries
[10]Millennium Ecosystem Assessment (MEA) (2005) Current State and Trends: Dryland Systems Report, p 626 http://www.maweb.org/documents/document.291.aspx.pdf
[11] Millennium Ecosystem Assessment (MEA) (2005), *Ecosystems and Human Well-being: Current State and Trends: Findings of the Condition and Trends Working Group*, http://www.millenniumassessment.org/en/Condition.aspx. in The Department for Economic and Social Affairs of the United Nations (UNDESA) (2008) Trends in sustainable development: 2008-2009, p26 http://www.un.org/esa/sustdev/publications/trends2008/fullreport.pdf
[12] Millennium Ecosystem Assessment (2005), *Ecosystems and Human Well-being: Current State and Trends: Findings of the Condition and Trends Working Group*, http://www.millenniumassessment.org/en/Condition.aspx. in The Department for Economic and Social Affairs of the United Nations (UNDESA) (2008) Trends in sustainable development: 2008-2009, p26 http://www.un.org/esa/sustdev/publications/trends2008/fullreport.pdf

recurring drought, such threats are likely to lead to land degradation and desertification, and heightened poverty levels[13].
Whilst Africa is not beset with more natural disasters than other continents, it is the most susceptible to the impacts of natural disasters and severe weather events, such as drought, for example, the number of people affected and rates of mortality – hot spots for drought mortality are centred entirely in sub-Saharan Africa, and with economic loss hot spots for drought likely to be found in more developed areas, such as, the Middle East, Mexico, north-east Brazil, north-east China and southern Europe[1415] (figure 2).

Just three investigative assessments of the global extent of desertification are available, only one of which has been conducted since the Summit in 1992[16]. Measurements for global desertification gained from these assessments vary considerably, as a result of calculation methods and on the types of land degradation contained in the estimates[17]. According to the Millennium Ecosystem Assessment (MEA), the total global area of desertified land is 6-12 million square kilometres, dramatically different to the 3.6 billion hectares (36 million square kilometres) estimated originally in Agenda 21, highlighting the need for better monitoring systems[18]. Presently 1-6 percent of the dryland people are living in desertified land, yet there are significantly greater numbers at risk of land degradation[1920].

[13] UNDESA (2009), Trends in Sustainable Development: Africa Report
http://www.un.org/esa/sustdev/publications/trends_africa2008/fullreport.pdf p39
[14] UNDESA (2008), Trends in Sustainable Development: agriculture, rural development, land, desertification and drought
http://www.un.org/esa/sustdev/publications/trends_africa2008/fullreport.pdf p34
[15] IBRD/World Bank and Columbia University (2005), Natural disaster hotspots: A global
risk analysis: synthesis report http://sedac.ciesin.columbia.edu/hazards/hotspots/synthesisreport.pdf
[16]Millennium Ecosystem Assessment (MEA) (2005), Ecosystems and Human Wellbeing Desertification Synthesis Report, p7
http://www.maweb.org/documents/document.355.aspx.pdf
[17]Millennium Ecosystem Assessment (MEA) (2005), Current State and Trends Dryland Systems Report, 22.4.1
http://www.maweb.org/documents/document.291.aspx.pdf
[18]Millennium Ecosystem Assessment (MEA) (2005), Ecosystems and Human Wellbeing Desertification Synthesis Report, p1
http://www.maweb.org/documents/document.355.aspx.pdf
[19]Millennium Ecosystem Assessment (2005) Ecosystems and Human Wellbeing: Desertification Synthesis Report, p1
http://www.maweb.org/documents/document.355.aspx.pdf
[20]Assessments on the degree of global desertification vary, yet in applying the most conservative estimates and taking into account the millions of people threatened by desertification, it remains a major present and future global environmental problem

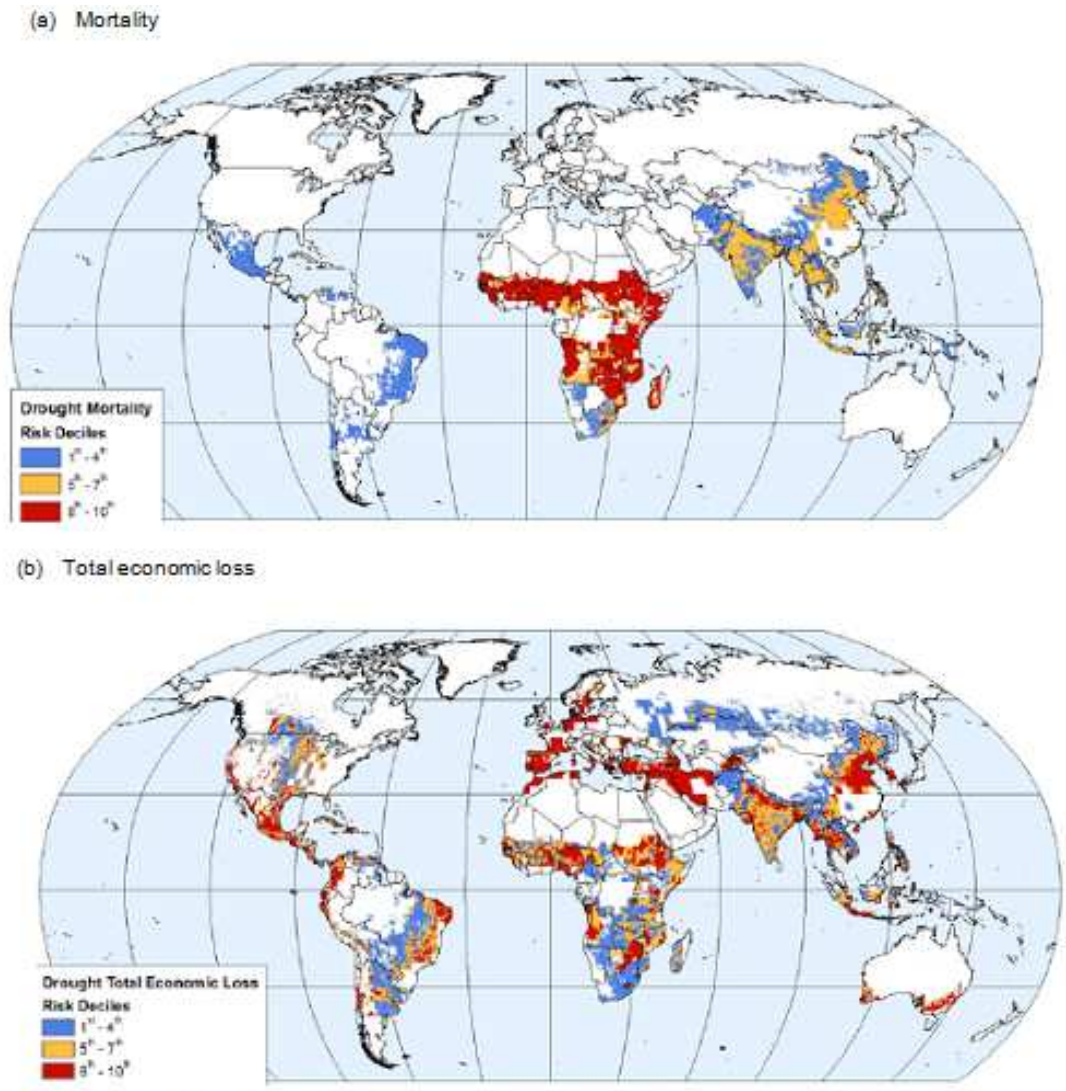

Figure 2. Global distribution of drought risk (a) mortality (b) total economic loss
Source: IBRD/World Bank and Columbia University, 2005:17.

Global Level Initiatives

As an integrated, international approach to address the problem of desertification, the United Nations Convention to Combat Desertification (UNCCD)[21] was established in 1996. The Convention, acts as the single legally binding universal agreement to addresses land degradation and desertification by establishing an internationally agreed framework for national, regional and international actions on desertification. The Convention operates through national, sub-regional and regional action programmes. As of March 2008, 193 Country Parties have signed the Convention. To promote the implementation of the objectives of the Convention, a ten-year strategic plan and framework (A/C.2/62/7)[22] was established in 2007. The initiative will be

[21]United Nations Convention to Combat Desertification http://www.unccd.int/convention/menu.php [accessed 24/05/2011]
[22]The ten-year strategic plan and framework to enhance the implementation of the United Nations Convention to Combat Desertification (2008-2018) http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N07/557/80/PDF/N0755780.pdf?OpenElement

executed through cooperation across agencies – UNCCD, United Nations Environment Programme (UNEP), United Nations Development Programme (UNDP), International Fund for Agricultural Development (IFAD), and the United Nations Department for Public Information (UNDPI).

Information and monitoring systems

Whilst the knowledge base on desertification and drought has been strengthened, and the information and monitoring systems are now better established and display a higher level of accuracy, achieving the targets in Agenda 21 still remains a challenge. It is recognised that a system of climate and weather observations have been established at the international level, for example, the Global Earth Observation System of Systems (GEOSS) - composed of the Global Climate Observing System (GCOS) and the Global Terrestrial Observing System (GTOS). The GEOSS is being implemented by the Group on Earth Observations, with participating entities including the World Meteorological Organisation (WMO)[23], UNEP and the FAO. The GEOSS aims to develop existing national, regional and international systems in order to provide comprehensive, coordinated global observations, and to convert this data into essential information for society. However, compatible networks, that additionally assess socio-economic impacts at regional, sub-regional and national levels are lacking, principally, in Africa[24].

National Level Initiatives

Specifically addressing programme area (a) of the Chapter – strengthening the knowledge base and developing information and monitoring systems[25], National Action Programmes (NAPs) on desertification[26] have been drawn up by approximately 80 countries, with additional countries presently in the preparation stage. In numerous NAPs, the creation of, information and monitoring systems, inventories, and land-use information and analysis are main priorities. NAPs are formed through a participative approach with a high level of community engagement[27] and are complemented by regional and sub-regional action programmes. This approach has, in some instances, led to institutional and legislative reforms that support more efficient, functional policies and approaches for mitigating against the effects of drought and combating desertification[28].

At a national level there has been improvement towards attaining unity between anti-desertification programmes, national development plans and poverty reduction strategies – specific countries include, China, Burundi, Kenya, Tunisia, Burkina Faso and Uganda. However, in the majority of countries mainstreaming the NAPs into national development plans and frameworks has been restricted by limited capacity and resource constraints, for example, in information and knowledge management, cross-sector coordination and integrated planning[29]. Additional criticisms of NAPs include their lack of long-term vision and that the broadness of the intervention priority areas - set by the UNCCD- within the NAPs[30].

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[23]The World Meteorological Organisation act as the United Nations systems authoritative voice on weather, climate and water

[24]Balgis Osman Elasha, Mahmoud Medany, Isabelle Niang-Diop, Tony Nyong, Ramadjita Tabo and Coleen Vogel, "Impacts, Vulnerability and Adaptation to Climate Change in Africa". Background paper commissioned by the United Nations Framework Convention on Climate Change Secretariat for the African Regional Workshop on Adaptation, Accra, 21-23 September 2006,p34 http://unfccc.int/files/adaptation/adverse_effects_and_response_measures_art_48/application/pdf/200609_background_african_wkshp.pdf

[25]Chapter 12, 12.6, Agenda 21, http://www.un.org/esa/dsd/agenda21/res_agenda21_12.shtml

[26]http://www.unccd.int/actionprogrammes/menu.php

[27]Ibid

[28]Policy options and actions for expediting progress in implementation: desertification http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/651/95/PDF/N0865195.pdf?OpenElement

[29]United Nations Economic and Social Council (2008) Review of implementation of Agenda 21 and the Johannesburg Plan of Implementation: Desertification http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/235/48/PDF/N0823548.pdf?OpenElement

[30]Governing global desertification: linking environmental degradation policy, Johnson, P.M., Mayrand, K., and Paguin, M. (2006) http://books.google.co.uk/books?hl=en&lr=&id=da6vhzHEpf0C&oi=fnd&pg=PA147&dq=review+of+National+Action+pROGRAMME

The most recent Global Assessment Report on Disaster Risk Reduction (2011) (GAR 2011) highlights that an insufficient number of countries have the appropriate policies required to cope with the effects of droughts – which, have lead to the deaths of millions of people[31].

Increasing awareness of the impacts of drought and their intensification as a result of climate change has led to the call for approaches that focus on risk-based management – such as, early warning systems, insurance schemes, and farmer safety nets (Box 1) - rather than the reactive crisis-management of the past. However, many countries and regions lack appropriate infrastructure to adopt a compressive and successful approach to risk assessment, impact evaluation and impact management.

Box 1: Risk-Based Management Approaches Against Drought

Early Warning Systems and Food Aid, Botswana: The Government of Botswana have created institutions within government ministries to address numerous factors of drought management. In 1984 the Government launched a Drought Early Warning System in order to improve drought preparedness, mitigation and reaction. The system in place considers data gathered across agriculture, rainfall, climate and human nutrition in order to assess the drought risk – such assessments are used to develop monthly and annual reports which are then used to assist decision makers on whether or not drought will be declared. If, declared, food aid is distributed to those communities affected by drought within days. Since this system has been in place Botswana has endured no human loss as a result of drought. Additionally, this system is recognised for economic savings at the household and the Government level.

UNISDR (2009) Drought Risk Reduction Framework and Practices
http://www.unisdr.org/files/11541_DroughtRiskReduction2009library.pdf 129

The adoption of sustainable technologies and practices has improved soil productivity and overall production systems in drylands. Technologies and practices include widespread soil and water conservation, improved use of mineral fertilisers and manure, drought-resistant crop varieties and the adoption of alternative livelihood systems, which take advantage of the distinctive characters of drylands – for example, solar energy, eco-tourism related activities, dryland aquaculture of crustaceans, fish and industrial compounds produced by microalgae. In a number of developing countries –the significant contribution sustainable forest management can provide in combating desertification, land degradation and climate change has been acknowledged through the implementation of afforestation, reforestation and forest protection schemes. Specific national examples can be seen in Box 2. A crucial feature for the motivation and adoption of such technologies and practices by farmers has been the provision of incentives – for example, providing affordable access to the above agricultural technologies, such as drought resistant crops, economic and social infrastructure development, and the provision of environmental and agricultural based extension services and training[32].

S+FOR+UNCCCD&ots=8BtJjHjpbd&sig=z472Fzyf9VRiozojcW5VsnAb__M#v=onepage&q&f=false
[31]UNISDR (2011) Global Assessment Report on Disaster Risk Reduction: Revealing Risk, Redefining Development
http://www.preventionweb.net/english/hyogo/gar/2011/en/bgdocs/GAR-2011/GAR2011_ES_English.pdf
[32]United Nations Economic and Social Council (2009) Policy options and actions for expediting progress in implementation: desertification
http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/651/95/PDF/N0865195.pdf?OpenElement

Box 2: National Examples of Sustainable Forest Management

Operation Acacia: The FAO's 'Operation Acacia' began in 2003 with the aim of assisting Sahelian farmers in Burkina Faso, Chad, Kenya, the Niger, Senegal and the Sudan to restore degraded lands by planting Acacias. Acacias produce resins and gums, products which are of significant importance for Sahelian farmer's livelihoods.

Operation Acacia has led to 13,000 hectares of degraded land being restored, as a result of such, animal feeding has improved and conflicts between pastoralists and farmers has been reduced. The project has trained around 56,000 gum Arabic and resin producers in methods to enhance their production in order to reach international market standards, allowing increased sales overseas. Increased sales have led to increasing levels of income for the farmers, allowing them to diversify their livelihoods. The project has received financial support from the Italian Government.
www.fao.org/english/newsroom/news/2003/24339-en.html

Burkino Faso: The Mossi plateau in the central area of the Sanguié province in Burkina Faso has suffered from uncertain rainfall and recurrent droughts for over 20 years. As a result of such climatic conditions and an increasing population density the degradation of the region's forest resources has accelerated, with the region exhibiting wood and cropland shortages.

UNDP 's project aimed to improve the poorly developed soils, to assist local communities in a campaign to rehabilitate the lands - through protecting and regenerating the local natural resources – and to improve the lands productivity and enhance the rural communities' livelihoods. Under the project forest management groupings (GCF) were established in order to manage the use of wood resources, agro-pastoralism was encouraged, awareness was raised on the importance of preserving forest resources, disadvantaged forester groups were empowered, forestry techniques previously in use were improved for rehabilitating tree cover, energy conservation was promoted through the use energy efficient stoves, and the national government was encouraged to establish regulations for urban wood-supply chains. A new Forest Code and Land Reform programme was developed, which delimits the legal framework of resource exploitation in state reserves. The project has received financial support from the Swedish International Development Cooperation Agency (SIDA).

The project led to improved community livelihoods, improved ecosystem conditions, increased levels of awareness on the need to preserve forest resources, sustainable fuel wood supply increased and a new Forest Code and Land Reform programme was established, that defines the legal framework of resource exploitation in the state reserves.
http://unddd.unccd.int/docs/success_stories/Success_story_Burkinafaso.pdf

Despite these successful initiatives, access and the ability to adopt technologies, for example drought-tolerant crops are still limited due to the high-cost of technologies and weak technology transfer between government levels (Box 3). Additionally, these efforts are hugely restricted by barriers of land tenure insecurity – this issue has only been addressed by a few countries and remains a significant challenge in preventing sustainable land management.

Box 3

A study implemented by the United Kingdom Department for International Development in semi-arid areas of sub-Saharan Africa – Burkina Faso, Senegal, Ghana, Nigeria, Uganda and the United Republic of Tanzania – found that over 50 percent of farmers attributed their lack of investment in soil and water conservation principally to insubstantial and ineffective extension services, lack of access to financial capital, lack of access to markets to sell produce at a competitive price, and poor access to fertilisers, tools and seeds.

Charlotte Boyd and Cathryn Turton (ed.), The Contribution of Soil and Water Conservation to Sustainable Livelihoods in Semi-Arid Areas of Sub-Saharan Africa. Agricultural Research & Extension Network (AgREN), Network Paper No. 102, London, January 2000, abstract

Financing
Within Chapter 12 it is stated that the Conference secretariat estimated the average total annual cost (for the years 1993-2000) of implementing the five programme areas to be approximately $350 million including around $175 million from the international community in the form on grants or concessional terms[33]. Estimates on desertification aid[34] from DAC members[35] for the years 1998-2000 are approximately $700 million annually, with one-half of the total desertification-related aid allocated to Africa[36]. This figure is significantly higher that outlined in Agenda 21. For the years, 2005-2007, average total annual desertification-aid is estimated to be $1521 million, dramatically exceeding figures for outlined figures for costs in Agenda 21.

Challenges and Conflicts

Whilst some progress has been made to implement the objectives outlined in Chapter 12 of Agenda 21, there is agreement that progress remains inadequate with desertification and drought threatening to hinder or reverse the development progress of many countries and regions. This is augmented when considering the present and projected impacts of climate change on drought and land degradation in the drylands.

Challenges that have been highlighted both among UN Member States and key actors are: continual unsustainable land use/land management; mobilising stakeholder participation and investment – to more sustainable practices; the lack of practical and effective information and monitoring systems; and institutional inadequacies.

Information and Monitoring Systems
Present information and monitoring systems do not provide the level of detail that is needed for assessments of the causes and extent of desertification issues, or the assessment of the effectiveness of current policies and strategies, thus preventing the development of future effective policies. There remains the need for practical and effective information systems to study desertification trends, patterns of drought, rehabilitation, and the assessment of their socio-economic impacts.
This is further augmented by insubstantial institutional networks with inadequate communication, coordination and collaboration between institutions that do not succeed in distributing accurate and comprehensible data within an appropriate time frame[37].

UNCCD Effectiveness
The UNCCD effectiveness has been criticised, particularly with respect to the lack of implementation on the ground, which has been attributed to an insufficient institutional interface between convention activities and the scientific community, which in turn has been credited to: political conflicts as to whether the UNCCD is a development or an environment convention; a

[33]Chapter 12, 12.11, Agenda 21, http://www.un.org/esa/dsd/agenda21/res_agenda21_12.shtml
[34]Desertification-related aid is defined as activities that combat desertification or mitigate the effects of drought in arid, semi arid and dry sub-humid areas through prevention and/or reduction of land degradation, rehabilitation of partly degraded land, or reclamation of desertified land. http://global-mechanism.org/dynamic/File/Simone/Status%20of%20AID%20May%202009%20447kb.pdf
[35]http://global-mechanism.org/dynamic/File/Simone/Status%20of%20AID%20May%202009%20447kb.pdf
[36]http://www.oecd.org/dataoecd/2/20/1944468.pdf
[37]Review of implementation of Agenda 21 and the Johannesburg Plan of Implementation: Desertification http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/235/48/PDF/N0823548.pdf?OpenElement

dearth of scientific contributions in the content of the convention text, resulting in inadequate pathways for the exchange of scientific information and social learning becoming established amongst the involved institutional levels; a restricted scientific knowledge base on which to form policy decisions, as the result of the largely political membership of the convention's Committee on Science and Technology (CST); and disparities between the provision of, and the request for scientific information. It is maintained that such problems are aggravated by the understated and non-authoritative outputs of the CST meetings, resulting in accusations of being uncompromising, inappropriate and unrelated to current policy discussions[38]. In addition, it is argued that the interdepencies between the three Rio Conventions – Convention on Biological Diversity, Climate Change, and to Combat Desertification - remains to be ignored, with the synergistic potential untouched. Moreover, in ignoring such complementarities, sectors, policies and programmes overlap and become counterproductive[39].

Impacts of Climate Change

Climate exacerbates desertification and increases the vulnerability to desertification as a result of the rise in evapotranspiration and decreases in rainfall[40]. The local manifestation of impacts of climate change are location-dependent, however, these impacts have has been seen particularly in Africa.

Lack of Financial Resources

An inadequate volume of financial resources across all levels remains a challenge to combating desertification and mitigation against drought. With high levels of poverty and lack of access to affordable credit services at the local level, investment in more sustainable technologies and practices has been limited. At the national and regional levels, large, long-term investments are much needed, particularly in order to distribute prevailing technologies. Across all levels there remains a lack of essential private sector investment, with endeavours that have aimed to attract private capital often failing due to the limited number of financial incentives that could lead to valuable investment revenue.

Way Forward

Integration

Integrating comprehensive anti-desertification programmes and drought-risk reduction programmes into national development plans – for example, poverty reduction approaches and climate change adaption strategies -, national environmental planning and effective natural resource management remains a crucial step towards tackling the challenges created by desertification. This coordinated approach would reduce overlap and should ensure more security in terms of access to funding and other resources[41]. An emerging and recognised trend is the relationship between climate change and land degradation and drought in the drylands. These links must be addressed in national and regional policies aimed at combating desertification and

[38] Steffen Bauer and Lindsay C. Stringer. (2008). Science and policy in the global governance of desertification. An analysis of institutional interplay under the United Nations Convention to Combat Desertification. Global Governance Working Paper No 35. Amsterdam et al.: The Global Governance Project. http://www.ppl.nl/ebooks/files/C08-0097-Bauer-Science.pdf pii, p12

[39] Prof. Klaus Töpfer, K (2006) Controlling desertification: An essential element of global governance, in The Role of Governance in Combating Desertification, specialist conference report, GTZ Haus, Berlin, September 7, 2006 http://www2.gtz.de/dokumente/bib/07-0302.pdf, p10

[40] *Ecosystems and Human Well-Being: Desertification Synthesis.* Millennium Ecosystem Assessment (MEA), (2005), World Resources Institute, Washington, D.C., p. 8.

[41] Policy options and actions for expediting progress in implementation: desertification http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/651/95/PDF/N0865195.pdf?OpenElement

mitigating drought, particularly in regions, such as Africa and West Asia[42]. In order for such integration and execution to be successful, institutional capacities must be strengthened. Integrating anti-desertification programmes into national development plans and environmental planning remains an area in need of attention.

Information and Monitoring Systems

Information, monitoring and forecasting systems must be improved. These must be supported by national institutions and have the required technical assistance from international institutions[43]. At a national level the collection and analysis of current and accurate information will improve the ability to develop effective and appropriate policies to combat desertification and drought and to mitigate their effects. In addition, such current and accurate information should be disseminated and made more accessible to those at the local level in order for effective local action to occur. There is the need for greater levels of stakeholder participation and community engagement in information collection and monitoring at the local level, with such data - being collected across a wide timescale - being useful for creation of appropriate projects. In addition, the scientific knowledge of the environmental services that are provided by dryland areas must be enhanced.

Improved Communication and Coordination

Greater and improved levels of communication and coordination between research institutions, extension workers, policy-makers and practitioners are required and must be put into place in order for a wider access of information on successful technologies, systems and practices across national and regional levels. Improved communication and coordination will allow a faster transfer of knowledge and will bridge the capacity, technological, human resources and economic gaps[44].

Payments for Ecosystem Services

Payments for Ecosystem Services (PES) could enhance sustainable development of fragile areas by providing incentives at the local and regional level for sustainable land practices. [45] However, there are mixed views regarding the widespread workability of this approach, and such options need to be explored further.

Increasing Incentives

Two important obstacles to overcome at all levels are: insecure land tenure; and lack of access to markets. With step-changing policies required to tackle both. Without the guarantee of legal ownership or rights to natural resources there is little incentive for farmers to implement and invest in, sustainable agricultural practices. Incorporating the implementation of land administration policies with land planning and management policies will produce benefits in the encouragement of sustainable land-use practices and will tackle issues causing land degradation. However, such policies must be modified to local level conditions, with attention on decentralised implementation and the involvement of stakeholders with their active participation.

[42] Policy options and actions for expediting progress in implementation: desertification http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/651/95/PDF/N0865195.pdf?OpenElement
[43] Policy options and actions for expediting progress in implementation: drought http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/651/89/PDF/N0865189.pdf?OpenElement
[44] Policy options and actions for expediting progress in implementation: desertification http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/651/95/PDF/N0865195.pdf?OpenElement
[45] Payments for Ecosystem Services (FAO): http://www.fao.org/es/esa/pesal/aboutPES.html

Chapter 13: Managing Fragile Ecosystems: Sustainable Mountain Development

Introduction

Chapter 13 of Agenda 21 – 'Managing Fragile Ecosystems: Sustainable Mountain Development' – represents the first global-scale acknowledgement of mountains as important socio-ecological systems.[1] The Chapter recognises that these systems are particularly vulnerable to environmental and non-environmental stressors, and are undergoing rapid changes. Chapter 13 states that 'the proper management of mountain resources and socio-economic development of the people deserves immediate attention'.[2]

At present, 27 % of the world's land surface is covered by mountain areas.[3][4] These areas sustain an estimated 720 million people, 12% of the global human population[5]. Over 90% of the mountain population live in developing countries,[6] 70% of which live in rural areas.[7]

Mountain ecosystems have high global significance as the source of the majority of the world's freshwater, acknowledged as 'water towers' for the world's lowlands. The majority of the world's major rivers and several minor ones begin in mountains,[8] with more than 50% of mountain regions providing an essential or supportive role of water provision for downstream regions[9] - for use in agriculture, households, industry and for generating electricity. 7% of global mountain areas are classed as having an essential role in the provision of water resources for lowland water

[1] Macchi, M. (2010) Mountains of the World - Ecosystem Services in a Time of Global and Climate Change : Seizing Opportunities - Meeting Challenges. ICIMOD http://www.icimod.org/publications/index.php/search/publication/708

[2] Chapter 13, Agenda 21 http://www.un.org/esa/dsd/agenda21/res_agenda21_13.shtml

[3] UNEP-WCMC (2002) Mountain Watch: environmental change and sustainable development in mountains. Nairobi http://www.unep-wcmc.org/medialibrary/2010/09/10/71bb554a/Mountain_Watch.pdf p8

[4] There is not one sole definition of a mountain area, as such, estimates for global mountain coverage vary. In this paper, the definition use is based upon the total of seven mountain classifications developed by UNEP-WCM, with the support of the Swiss Development Corporation. Such classifications were created based upon altitude and slope in combination so as to represent the environmental gradients that are crucial components of mountain environments (Kapos *et al* 2000). The classifications are as follows: (1) elevation > 4,500m (2) elevation 3,500-4,500m (3) elevation 2,500-3,500m (4) elevation 1,500-2,500m and slope ‡ 2° (5) elevation 1,000 – 1,500 m and slope ‡ 5° or local elevation range (7 km radius) > 300 m (6) elevation 300 – 1,000 m and local elevation range (7 km radius) > 300 m (7) isolated inner basins and plateaus less than 25 km2 in extent that are surrounded by mountains but do not themselves meet criteria 1-6. For more information see p12, p74 in -WCMC (2002) Mountain Watch: environmental change and sustainable development in mountains. Nairobi http://www.unep-wcmc.org/medialibrary/2010/09/10/71bb554a/Mountain_Watch.pdf Kapos, V., Rhind, J., Edwards, M.,Price, M.F. and Ravilious, C. (2000) Developing a map of the world's
mountain forests In M.F. Price and N. Butt (eds.) Forests in sustainable mountain development: A state-of-knowledge report for 2000. CAB International, Wallingford: 4-9.

[5] Huddleston, B. and Ataman, E. (2003) Towards a GIS-based analysis of mountain environments and populations, Environment and Natural Resources Working Paper No. 10. Rome: Food and Agriculture Organization of the United Nations ftp://ftp.fao.org/docrep/fao/005/Y4558E/Y4558E00.pdf

[6] Huddleston, B. and Ataman, E. (2003) Towards a GIS-based analysis of mountain environments and populations, Environment and Natural Resources Working Paper No. 10. Rome: Food and Agriculture Organization of the United Nations ftp://ftp.fao.org/docrep/fao/005/Y4558E/Y4558E00.pdf

[7] Spehn, E., Berge, E., Bugmann, H., Groombridge, B., Hamilton, L., Hofer, T., Ives, J., Jodha, N., Messerli, B., Pratt, J., Price, M., Reasoner, M., Rodgers, A., Thonell, J., Yoshino, M. (2005) Ecosystems and human well-being: Current state and trends. Volume 1: Findings of the condition and trends, Chapter 24, Mountain Systems, Working Group of the Millennium Ecosystem Assessment. Washington: Island Press
http://www.maweb.org/documents/document.293.aspx.pdf

[8] Messerli and Ives 1997

[9] Viviroli, D., Dürr, HH., Messerli, B., Meybeck, M., Weingartner, R. (2007) Mountains of the world, water towers for humanity: typology, mapping, and global significance. Water Resource Research 43: W07447, p1
https://eng.ucmerced.edu/people/fliu/ES214files/WRR_2007_Viviroli

users, whilst 37% are considered to provide an important supportive supply, particularly in arid and semi arid regions susceptible to seasonal and regional water shortages.[10]

Mountain ecosystems affect the climates of their regions and act as critical carbon sinks.[11] In addition, mountains act as repositories of biological and cultural diversity, knowledge and heritage, and have high economic value – through activities such as tourism and recreation – for both mountain communities and lowland populations.
The Chapter concentrates on two programme areas – (a) generating and strengthening knowledge about the ecology and sustainable development of mountainous ecosystems, and (b) promoting integrated watershed development and livelihood opportunities.

Implementation

Global and Regional Initiatives and Partnerships

The Food and Agriculture Organisation of the United Nations (FAO) acts as the main instrument at a United Nations level to implement the programme areas identified in Agenda 21. Assigned as the Task Manager for Chapter 13, the FAO assembled a task force in 1994 to help coordinate its implementation – the Interagency Group on Mountains - comprised of non-governmental organisations (NGOs), development organisations, and UN agencies.

Box 1: ICIMOD programmes

Knowledge Management: Human Capacity Development of Afghan Universities (HCD/AU)
This project aims to improve the performance of Kabul University and other selected universities and higher education institutes in Afghanistan studying the environmental and development needs of Afghanistan's mountain communities in the reconstruction phase by strengthening the capacity of the faculty members and staff– particularly at Kabul University. The project provides education, consultation, and research opportunities at, or presented by, members of the 'Himalayan University Consortium' (HUC). Through such methods, the project concurrently extends knowledge networks between resource centres in the Himalayan region. The duration of the project is from March 2008-August 2011.
http://www.icimod.org/?q=400

Sustainable Livelihoods: Improving Livelihoods through Knowledge Partnerships and Value Chains of Bee Products and Services in the Himalayas
This project aims to improve the resilience of the mountain communities to cope with the impacts of environmental and global change, aiming to enhance the incomes of the mountain population by encouraging the value chains of honeybee products and their pollination services through the development of institutional and human capacities and through regional cooperation. Beekeeping technologies were perfected at specific field test sites and the program was spread through national extension and regional development networks. ICIMOD addresses issues of pro-poor value chains for bee products and services and quality standards by establishing national monitoring plans for residues, national beekeeping censuses for traceability, national honey sample policy and GMP guidelines.
http://www.icimod.org/?q=395

Following the agreement of Agenda 21, numerous mountain-specific initiatives by governments, international bodies, scientific organisations and NGOs have been established in order to meet programme area (a) of the Chapter - generating and strengthening knowledge about the ecology

[10] ibid, p12
[11] Macchi, M. (2010) Mountains of the World - Ecosystem Services in a Time of Global and Climate Change : Seizing Opportunities - Meeting Challenges. ICIMOD http://www.icimod.org/publications/index.php/search/publication/708

and sustainable development.[12] A key initiative was the founding of the Mountain Forum[13] in 1995. The Mountain Forum exists as a crucial international network for global information exchange and a worldwide support mechanism towards sustainable mountain development. An equally important organisation increased its activities since Agenda 21, the International Centre for Integrated Mountain Development (ICIMOD).[14] ICIMOD is the first international and independent network for information exchange and mountain research. As one of the most established organisations advocating sustainable mountain development ICIMOD is critical in ensuring a coordinated approach of over 300 institutions and donors within and outside the region towards the Mountain Agenda. Key activities of the ICIMOD that address the two programme areas outlined in Chapter 13 of Agenda 21 include programmes addressing: integrated water and hazard management; environmental change and ecosystems services; sustainable livelihoods and poverty reduction. Examples of specific ICIMOD programmes can be seen in Box 1.

In 1998, the United Nations General Assembly declared 2002 as the International Year of the Mountains (IYM)[15] in a resolution supported by 130 states. Additionally, the General Assembly agreed to host a 'Bishek Global Mountain Summit' in the same year, at the request of the Krgyz Republic.[16] With the Global Mountain Summit and as the IYM, 2002 acted as a year to greatly renew awareness of the global importance of mountains and acted as a platform to promote further action towards sustainable mountain development.
There is widespread consensus that the Mountain Agenda[17] gained new momentum as a result of activities – particularly, the attention gained for the Agenda as a result of the IYM – undertaken in 2002. Designating 2002 as the IYM led to an increase in: research and development projects, increased financial mechanisms, conferences and workshops, and the creation of new initiatives. Important initiatives that materialised were: the Mountain Research Initiative (MRI),[18] Global Change in Mountain Regions (GLOCHAMORE),[19] and the Adleboden Group – which led to the establishment of the Sustainable Agriculture and Rural Development in Mountains (SARD-M) project (Box 2).

Box 2 Sustainable Agriculture and Rural Development in Mountains (SARD-M) project

The SARD-M project, a partnership between governments and civil society launched in 2005, is an integration of Sustainable Agriculture and Rural Development (SARD) and mountain issues. The project addresses agricultural, water, energy, health and biodiversity issues in mountains at the national level and utilises the knowledge of local people and organisation. The project aims to strengthen local institutions, build national capacity, and establish a network of regional focal points to manage the project at the local level.

A key initiative of the project is the SARD-M database, which contains documents – such as national case studies and policy studies – associated with the economic, environmental, institutional and social policies for sustainable agriculture and rural development in mountain areas.
http://www.fao.org/sard/en/sardm/about/650/index.html

[12] 13.4 Chapter 13, Agenda 21 http://www.un.org/esa/dsd/agenda21/res_agenda21_13.shtml
[13] http://www.mtnforum.org/
[14] http://www.icimod.org/
[15] Resolution 53/24 http://www.nyo.unep.org/pdfs/5324.pdf
[16] http://www.globalmountainsummit.org/
[17] 'The global initiative for bringing mountains into the forefront of the world's environmental agenda': International Centre for Integrated Mountain Development, ICIMOD http://www.icimod.org/?q=1389
[18] http://mri.scnatweb.ch/
[19] http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/specific-ecosystems/mountains/glochamore/

Impetus to the Mountain Agenda was further strengthened at the World Summit on Sustainable Development in 2002, with the adoption of the Johannesburg Plan of Implementation – of which paragraph 42 discusses actions needed to achieve sustainable mountain development – and the establishment of the Mountain Partnership – an organisation who act to encourage and facilitate stronger collaboration between governments, civil society, intergovernmental organisations, and the private sector towards addressing sustainable mountain development.

Members of the Mountain Partnership, including the Italian and Swiss Governments, the FAO, the World Bank, UNEP, and ICIMOD, are collaborating to gain awareness for sustainable mountain development, mountain ecosystems, and the voices of the mountain communities in the Rio+20 procedures. These institutions have assembled a strategic association in order to set the Mountain Partnership in the position as a representative to ensure renewed political commitment for SMD and to drive the transformation towards Green Growth. Findings from regional and global assessments on the advancements towards SMC since the adoption of Agenda 21 in 1992 – led by the Government of Switzerland – and the conclusions of the Lucerne World Mountain Conference[20] – to be held in October 2011 – will be fed into the Rio+20 preparatory processes.[21]

Biodiversity Conservation and Mountain Ecosystems

In 2004, the United Nations Convention on Biological Diversity (UNCBD) implemented the Programme of Work on mountain biological diversity. At its 10th Conference of Parties in 2010 it conducted a review on the programme of implementation, finding that: the Programme of Work on mountain biological diversity has been successful in unifying the international mountain community and enhancing the capacities of organisations to promote the conservation and sustainable use of biodiversity; since 2009, approximately, 14.4% of mixed mountain system biomes are protected; and through International Mountain Days and regional and local initiatives awareness of the significance of mountain biodiversity has increased.[22]

National Level Initiatives

Since the creation of Chapter 13 there has been a growth in activities in support of sustainable mountain development initiated at the national and community level.[23] Recent increases in initiatives and support at the international level have promoted the introduction of action plans at the local level through the framework of national development plans.[24] Governments at a national level have become more engaged in the mountain agenda, a pattern which is also increasing at decentralised government levels. NGOs have been crucial in such endeavours, by increasing awareness of mountain issues and encouraging and supporting community level development programmes. Examples that address both programme areas (a) and (b) outlined in Agenda 21 can be found in Box 3.

Box 3: National Level Initiatives

Pakistan

In June 2011, the medium-term livelihood rehabilitation project in the earthquake-affected regions of Pakistan was successfully completed. The project (FAO reference symbol OSRO/PAK/701/SWE) was

[20] http://mountainslucerne2011.mtnforum.org/

[21] UN General Assembly (2011) Sustainable Mountain Development, Report of the Secretary General http://www.un.org/esa/dsd/resources/res_pdfs/ga-66/SG%20report_Sustainable%20Mountain%20Development.pdf p18

[22] Ibid, p9

[23] United Nations Economic and Social Council, Commission on Sustainable Development acting as the preparatory committee for the World Summit on Sustainable Development (2001) Report of the Secretary General on Sustainable Mountain Development http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N01/274/06/PDF/N0127406.pdf?OpenElement

[24] United Nations General Assembly (2009) Report of the Secretary General, Sustainable Mountain Development http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N09/439/22/PDF/N0943922.pdf?OpenElement

implemented by the Earthquake Reconstruction and Rehabilitation Authority with Swedish funding and technical support from FAO. The project consisted of a watershed development component and developed and executed integrated and collaborative watershed management plans in 17 watersheds. Examples of field activities include landslide stabilization and natural resource watershed management plans in 17 watersheds. Examples of field activities are: landslide stabilisation, natural resource management, livelihood improvement and institutional innovation.
http://www.erra.pk/Reports/Livelihood/Case%20Studies/Case%20Study%20-%20iwm%20and%20livelihoods%2029%20May%2009.pdf

UN General Assembly (2011) Sustainable Mountain Development, Report of the Secretary General
http://www.un.org/esa/dsd/resources/res_pdfs/ga-66/SG%20report_Sustainable%20Mountain%20Development.pdf p. 6

Mexico
The Government of Mexico is working through the National Forestry Commission (CONAFOR) to commence a project aiming to enhance the effectiveness of the national level payment for environmental services (PES) programme in upper watersheds and mountain areas, and to increase the provision of ecosystem services that produce benefits locally and globally. Additionally, this project encourages local mechanisms for PES, with financial support from those direct users of environmental services through a scheme of matching funds. This project is receiving financial support from the World Bank and GEF.

UN General Assembly (2011) Sustainable Mountain Development, Report of the Secretary General
http://www.un.org/esa/dsd/resources/res_pdfs/ga-66/SG%20report_Sustainable%20Mountain%20Development.pdf p. 8

Issues of sustainable mountain development rest among various programme areas and attempts at sustainable mountain development are often targeted through other sustainable development efforts and policies, predominantly: biodiversity conservation, climate change, disaster reduction, rural development, food security, water, forests, and tourism. Varying levels of progress have been made in these areas, details of which can be found in the additional analyses of the implementation of Agenda 21.[25]

Challenges and Conflicts

Although the Mountain Agenda has received increasing recognition and action across all levels since the adoption of Agenda 21, considerable challenges remain and have materialised, preventing the achievement of sustainable mountain development.

Mountain regions remain vulnerable to increasing pressures on natural resources - such as fresh water – for industries such as mining and agriculture, as a result of a growing global population and globalisation, they face growing levels of tourism, increasing levels of out-migration, and disproportionate rates of conflict.[26]

Emerging challenges include the threats associated with climate change, as mountain eco-regions are particularly susceptible to rapid environmental changes, and the global economic crisis,

[25] Specifically Chapters, 11, 14, 15, and 18 on forests, agriculture and rural development, biodiversity, and freshwater, respectively
[26] United Nations General Assembly sixty-fourth session (2009) Report of the Secretary General on Sustainable Mountain Development
http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N09/439/22/PDF/N0943922.pdf?OpenElement

leading to elevated food prices, increasing the quantity of hungry and undernourished people, with the mountains especially vulnerable to food shortages.[27]

Inter-sectoral Coordination

The formation of far-reaching and integrated approaches to sustainable mountain development has been hampered due to institutional constraints, particularly at a national level.[28] As stated, issues of sustainable mountain development fall into various programme areas; for this reason, the majority of development actions in mountain regions remain sector-based. This is recognized across levels as a major constraint to achieving sustainable mountain development as the particular concerns and problems affecting mountain regions and communities are often multifaceted and are frequently interconnected, and as such call for long-standing initiatives that allow for these inter-sectoral connections.

Transboundary Management

An additional challenge to sustainable mountain development is that mountain ranges, watersheds and river systems are often shared by numerous countries, and these areas' resources and environmental services, such as freshwater, are not owned by one nation and national sustainable development initiatives will only target specific areas of the mountain region. It is therefore important to develop comprehensive eco-specific and regional policies and initiatives that take this into account. This is of increasing importance as the global population continues to grow and the demands for natural resources increase – particularly with the likelihood of increasing water scarcities in dry seasons and increasing hazards in rainy seasons.[29]

Lack of Data

It has been identified across all levels that there remains a lack of mountain-specific statistics and information to provide a higher level of understanding of mountain regions. Not only does this limit the effectiveness and appropriateness of sustainable mountain development initiatives but it often limits levels of funding provided for mountain regions as there remains inadequate statistical corroboration that mountain regions are disproportionally suffering in terms of sustainable development targets, for example, food security and poverty. As a result, funding for mountain development has often been provided through other sustainable development initiatives, with little specific funding aimed at targeting sustainable mountain development.[30]

Lack of comprehensive specific sustainable mountain development strategies

With a lack of comprehensive specific sustainable mountain development strategies mountain regions are becoming further marginalised and inequities between mountain and lowland communities are increasing, with little reflection of the actual value of the goods and services originating from the mountains. The issue of costs and value of environmental services is gaining more attention and various payment for environmental services (PES) schemes[31] have been

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[27] United Nations General Assembly sixty-fourth session (2009) Report of the Secretary General on Sustainable Mountain Development
http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N09/439/22/PDF/N0943922.pdf?OpenElement

[28] United Nations Economic and Social Council, Commission on Sustainable Development acting as the preparatory committee for the World Summit on Sustainable Development (2001) Report of the Secretary General on Sustainable Mountain Development
http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N01/274/06/PDF/N0127406.pdf?OpenElement

[29] UNEP (2010) High mountain glaciers and climate change – Challenges to human livelihoods and adaptation
http://www.grida.no/files/publications/glacier/himalayareport_screen.pdf p40

[30] United Nations Economic and Social Council, Commission on Sustainable Development acting as the preparatory committee for the World Summit on Sustainable Development (2001) Report of the Secretary General on Sustainable Mountain Development
http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N01/274/06/PDF/N0127406.pdf?OpenElement

[31] PES schemes ensure a direct payment of compensation for the preservation or supply of an environmental service by users to the providers of such service. Spehn, E., Berge, E., Bugmann, H., Groombridge, B., Hamilton, L., Hofer, T., Ives, J., Jodha, N., Messerli, B., Pratt, J., Price, M., Reasoner, M., Rodgers, A., Thonell, J., Yoshino, M. (2005) Ecosystems and human well-being: Current state

implemented with success. However, this is not yet widespread and mountain communities and the environmental services mountain areas provide continue to be undervalued.

Climate Change

A major new challenge to sustainable mountain development is climate change. Climate change has the potential to exacerbate present development shortfalls and overturn development progress in mountain areas,[32] limiting the mountain population's ability to cope and adapt to changes in their environment. It is expected that mountain communities are amid those who will be the most negatively affected by destructive impacts of climate change.[33] Despite increasing recognition of the importance of mountains and the acknowledgment that these regions will be dramatically affected by climate change, which in turn will have global consequences, there remains a lack of mountain perspective in climate change policy. The ICIMOD maintain that mountains are not given appropriate levels of consideration in the United Nations Framework Convention on Climate Change (UNFCC) despite their importance as indicators of effects of global climate change. This is partly due to a significant scientific knowledge gap and an uncoordinated approach by mountain nations most affected by climate change.[34]

Overall, there is a lack of policies and laws in place at all levels to protect mountain areas and their people. The Mountain Partnership maintains that this is due to their physical isolation, their levels of poverty, language barriers, and minimal access to communication services.[35] These constraints mean that mountain populations often lack political influence and continue to be marginalised within sustainable development policy, and as such progress towards sustainable mountain development remains slow.

Way Forward

Since the creation of Agenda 21, it has become clear that whilst Chapter 13 acted as an initial step to address sustainable mountain development, it did not address many key issues sufficiently, including fresh water, biodiversity, cultural diversity and heritage, appropriate infrastructure development for mountain communities – health service access, market access etc. – value of ecosystem services, and the recreational and spiritual importance of mountains.[36]

Sustainable mountain development will be appearing as a key theme at the next cycle of sessions of the United Nations Commission on Sustainable Development (CSD20/CSD21).[37] It is hoped that this will once again renew momentum and focus for sustainable mountain development, acknowledging and addressing remaining and upcoming challenges.[38]

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and trends. Volume 1: Findings of the condition and trends, Chapter 24, Mountain Systems, Working Group of the Millennium Ecosystem Assessment. Washington: Island Press
http://www.maweb.org/documents/document.293.aspx.pdf

[32] UNDP (2010) Summary of implications from the East Asia and South Asia consultations: Asia Pacific human development report on climate change. Colombo: UNDP Asia Pacific Regional Centre. Human Development Report Unit.
http://hdru.aprc.undp.org/ext/HDRU/pdf/Asia_Stakeholder_Consultation_Meetings_for_the_APHDR_on_CC_Synthesis_Report.pdf

[33] Macchi, M. (2010) Mountains of the World - Ecosystem Services in a Time of Global and Climate Change: Seizing Opportunities - Meeting Challenges. ICIMOD http://www.icimod.org/publications/index.php/search/publication/708

[34] Macchi, M. (2010) Mountains of the World - Ecosystem Services in a Time of Global and Climate Change: Seizing Opportunities - Meeting Challenges. ICIMOD http://www.icimod.org/publications/index.php/search/publication/708

[35] http://www.mountainpartnership.org/issues/policylaw.html

[36] Sonesson, M., Messerli, B. (2002) The Abisko Agenda: Research for mountain area development. Ambio Special Report 11. Stockholm: Royal Swedish Academy of Sciences. http://www.jstor.org/pss/25094565

[37] http://www.un.org/esa/dsd/csd/csd_multyearprogwork.shtml#2012

[38] http://www.un.org/esa/dsd/csd/csd_multyearprogwork.shtml

Payment for Ecosystem Services
It is necessary for the international community to increase the support for policies that compensate the mountain population for the worth of the ecosystem services supplied by mountain regions. Payment for environmental services (PES) schemes are seen by a range of actors – such as ICIMOD – as an effective approach to compensate mountain communities for the environmental services they provide. Additionally, such PES schemes also offer incentives to the mountain communities to invest in more sustainable land-management practices. Legal frameworks are required to support this initiative.[39]

International Representation of Mountain Issues
At the international level, the United Nations must endeavour to support mountain communities in view of global climate change, specifically in relation to the UNFCCC. Greater levels of funding and targeted finance mechanisms are required which specifically address the needs and requirements of fragile mountain social-ecological systems – for climate change adaptation and impact management, which must be conducted through eco-region specific agendas.

Mountain-specific national policies
As stated, national-level policies often fail to acknowledge or address the unique conditions and challenges within mountain areas. As such mountain and eco-region specific policies must be developed that are independent of national boundaries. These policies must encouraged multi-stakeholder cooperation through institutional mechanisms such as ICIMOD and the Mountain Partnership in order for implementation to be as effective as possible.

Strengthening the Knowledge Base
A solid knowledge base is crucial for the development of successful and appropriate sustainable mountain development policies. Improving the knowledge base is thus of critical importance, particularly when considering the impacts of climate change. The development of a strong knowledge base, in order to gain a better understanding of the environmental, economic and social drivers of change affecting mountain regions benefit both mountain systems and will provide pertinent statistics and indicators to measure global climate change adaption measures.

Promoting alternative livelihoods
A programme area that has seen little successful activity is that of promoting alternative livelihood opportunities, as such there is the need for involvement at all levels to encourage the development of high-quality products and services from mountain regions, with increased involvement by the private sector – for example, ICIMOD encourages the development of alternative, sustainable livelihood options in order to empower mountain people to manage, adjust to, and benefit from the changes they are experiencing in order to lead to improved livelihoods, with higher levels of social and environmental security. ICIMOD monitors and analyses levels of poverty and its principle drivers and facilitates in the development of policy-applicable information with particular attention on high value products and value chains – niche services and products, novel livelihood options, and economic evaluation and analysis. Examples of such options include working with medicinal and aromatic plants, indigenous honeybees, and mountain tourism.[40] Further development of sustainable alternative livelihood strategies should be promoted at all levels.

[39] http://www.mountainpartnership.org/issues/policylaw.html
[40] http://www.icimod.org/?q=368

Chapter 14: Promoting Sustainable Agriculture and Rural Development

Introduction

Chapter 14 of Agenda 21 highlighted the difficulties in sustaining a growing global population, emphasizing problems with land and water resources, which stood to become increasingly degraded due to multiple and competing demands for their use. Degradation of the natural resource base represents a particular problem for the rural poor, due to the potential risks for livelihood security. The challenges created by ecological degradation and population growth are further compounded by the effects of climate change, rising energy prices, rising demands for animal products, and competition for the commercial use of land.

The chapter acknowledges that in order to tackle these challenges, increases in agricultural production must be linked to sustainable use of the natural resource base, in particular by 'increasing production on land already in use and by avoiding further encroachment on land that is only marginally suitable for cultivation'.[1] It is made clear that sustainable agriculture and rural development (SARD) will require 'major adjustments […] in agricultural, environmental and macroeconomic policy, at both national and international levels, in developed as well as developing counties', through agrarian reform, participation, income diversification, land conservation and improved management of inputs, and with the support and participation of rural people, national Governments, the private sector and international cooperation, including technical and scientific cooperation.[2] [3]

Whilst the focus of this chapter is on promotion of SARD, it is important to consider linkages to other chapters of Agenda 21, namely, chapters 3, 8, 9, 10, 12, 15 and 18, which focus respectively on combating poverty, integrating environment and development in decision making, protection of the atmosphere, combating desertification and drought, conservation of biological diversity and protecting freshwater resources.

Implementation

The Food and Agriculture Organisation of the United Nations (FAO), acting at UN level as the main instrument to implement the programme areas identified in Agenda 21, states that in order to sustain the projected global human population, food production must increase by 70 percent.[4] At present, 3.1 billion people representing 55% of the global population live in rural areas[5], which contain 70 percent of the world's poor.[6] Agriculture in rural areas plays an essential role, with

[1] http://www.un.org/esa/dsd/agenda21/res_agenda21_14.shtml
[2] Ibid.
[3] The 12 programme areas outlined in Agenda 21, Chapter 14, 14.4 and are: (a) Agricultural policy review, planning and integrated programming in the light of the multifunctional aspect of agriculture, particularly with regard to food security and sustainable development; (b) Ensuring people's participation and promoting human resource development for sustainable agriculture; (c) Improving farm production and farming systems through diversification of farm and non-farm employment and infrastructure development; (d) Land-resource planning information and education for agriculture; (e) Land conservation and rehabilitation; (f) Water for sustainable food production and sustainable rural development; (g) Conservation and sustainable utilization of plant genetic resources for food and sustainable agriculture; (i) Integrated pest management and control in agriculture; (j) Sustainable plant nutrition to increase food production; (k) Rural energy transition to enhance productivity; (l) Evaluation of the effects of ultraviolet radiation on plants and animals caused by the depletion of the stratospheric ozone layer. http://www.un.org/esa/dsd/agenda21/res_agenda21_14.shtml
[4] Food and Agriculture Organisation of the United Nations (FAO) 'Investing in Food Security' (2009) http://www.fao.org/fileadmin/templates/ag_portal/docs/i1230e00.pdf
[5] Rural Poverty Report 2011, IFAD http://www.ifad.org/rpr2011/report/e/rpr2011.pdf
[6] World Bank Data, http://data.worldbank.org/topic/agriculture-and-rural-development?display=graph

more than 80 percent of rural households farming to an extent.[7] The rural poor largely depend on agricultural activities to generate income and employment, and it is typically the poorest rural households who rely most on agricultural livelihoods.[8]

Incidence of extreme rural poverty

Currently, approximately 35 percent of the total rural population of developing countries is classified as living in extreme poverty – defined as living on less than US$1.25 per day - a reduction from 54 percent in 1988.[9] Figure 1 shows the incidence of extreme rural poverty across individual regions and across the developing world.

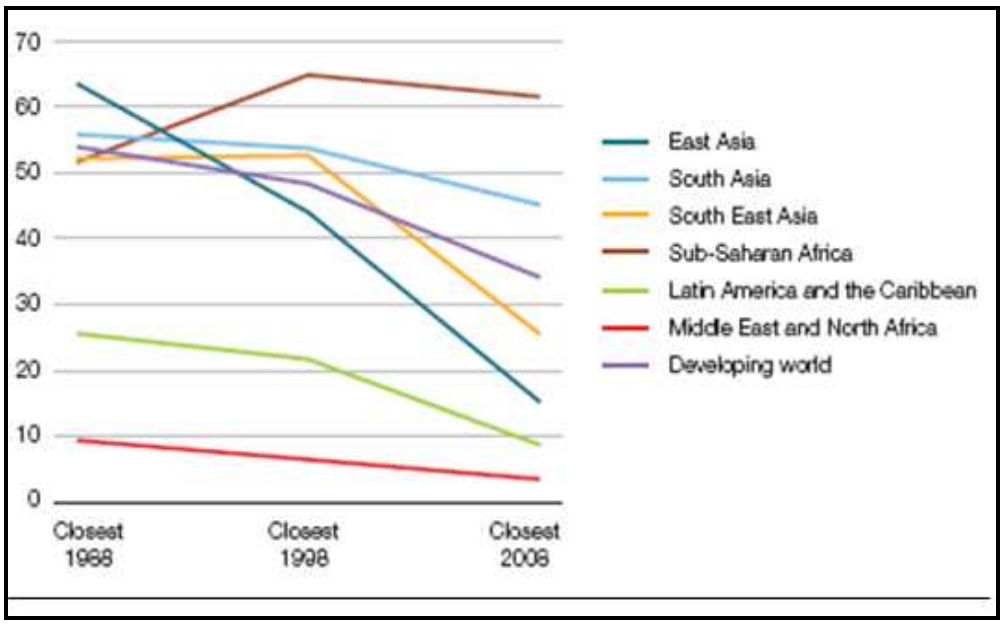

Figure 1. Incidence of extreme rural poverty (percentage of rural people living on less than US$ 1.25/day)

Source: Rural Poverty Report, 2011.

Figure 2 shows the number of rural people across individual regions that live in extreme rural poverty. The incidence of extreme rural poverty has reduced, due predominantly to a huge reduction in rural poverty in East Asia – particularly China, with the incidence of extreme rural poverty at approximately 15 percent. Incidences of extreme poverty has declined at a slower pace in South Asia and sub-Saharan Africa with over 45 percent and 60 percent of the rural population living on less than US$1.25 a day. Whilst most regions have seen a decline in the numbers of rural people living in extreme poverty (figure 2), sub-Saharan African has seen increases, with over 300 million extremely poor rural people.

[7] Rural Poverty Report, 2011, IFAD http://www.ifad.org/rpr2011/report/e/rpr2011.pdf
[8] Ibid.
[9] Ibid.

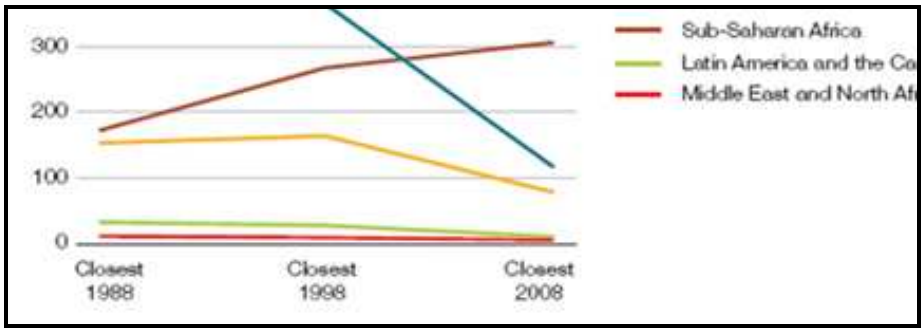

Figure 2. Rural people living in extreme poverty
Source: Rural Poverty Report, 2011.

Number of undernourished people in the world

The number of undernourished people in the world has been rising since 1995 (figure 3). This figure reached 1 billion for the first time in 2009 as a result of the food price and economic crises.[10] Improvements in economic growth and a reduction in food prices led to a decline in 2010, yet the figure remains higher than in 2008. Sub-Saharan Africa and South Asia contain the majority of undernourished people.

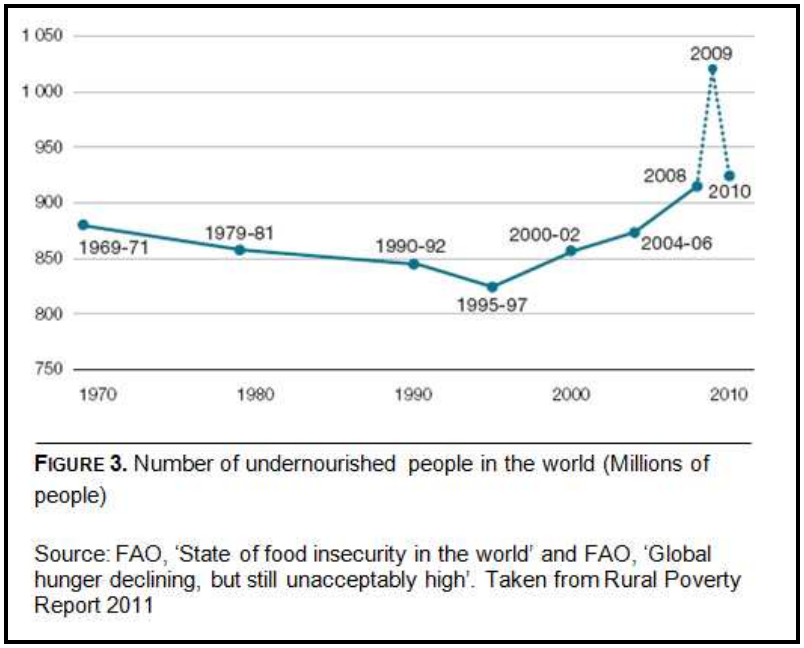

Figure 3. Number of undernourished people in the world, 1970-2010
Source: FAO, *State of food insecurity in the world* and FAO, *Global hunger declining, but still unacceptably high*, taken from Rural Poverty Rerport, 2011.

The World Food Summit in 1996 set the target of halving the number of undernourished people to approximately 410 million by 2015. However, projections by FAO indicate that this target will be hard to achieve, estimating that by 2015, approximately 610 million people could remain undernourished. Whilst Asia and the Pacific, Latin American and the Caribbean have seen a general reduction in undernourished people since 1996, sub-Saharan Africa and South Asia have

[10] FAO, within Rural Poverty Report 2011, IFAD http://www.ifad.org/rpr2011/report/e/rpr2011.pdf

not.[11] For these regions, the World Food Summit targets and the Millennium Development Goal of eradicating extreme poverty and hunger (goal 1) remain out of reach.

Agricultural productivity

Improvements in agricultural productivity have been widespread, due to the Green Revolution in Asia, resettlement policies in Latin America, and environmental conservation programmes in developed regions.[12] The relative scarcity of land, labour and capital 'have favoured investment in land-saving R&D in Asia and labour-saving R&D in North America'.[13] High income countries have managed to increase labour and land productivity, while Asia has shown high land productivity, but Sub-Saharan Africa suffers from low productivity in both areas with no increase in labour productivity as the labour force grows.[14] Therefore, increases in production in Sub-Saharan Africa have largely resulted from more extensive cultivation, whereas other regions have benefitted from greater crop varieties and improved irrigation, amongst other factors.[15]

Investment in agriculture

Asia is the only region in which public spending on agriculture as a share of agricultural GDP rose from 1980 to 2002, increasing threefold in real terms to 8.5 - 10.5%.[16] In Africa, spending on agriculture is well below the target set by the 2003 Maputo Declaration of Heads of State and Government of the African Union, which called for investment at the rate of 10% of agricultural GDP, at only 5.4 - 7.4%.[17] In Latin America, spending on agriculture relative to agricultural GDP decreased from 19.5 percent in 1980 to 11.5 percent in 2002.[18] External assistance to agriculture has fallen steadily since the 1980s, with multilateral assistance falling more sharply than bilateral assistance.[19]

Increased focus on Sustainable Agriculture and Food Security

Low global prices for food goods, minimal levels of public and private investment in agriculture across all levels, insufficient production and financial services, weak and uncompetitive markets, fragile rural infrastructure, a degrading natural resource base, and unsuitable policies have, together, contributed to producing a precarious and unprofitable environment for smallholders in developing countries participating in agricultural markets. Yet in the aftermath of the food price surge, various global initiatives have aimed to revive agriculture in developing countries, emphasizing climate change adaption for smallholder agriculture; the development of non-farm livelihoods; and the ways in which the rural poor can contribute to and benefit from new market opportunities associated with environmental services (PES) and climate change mitigation (carbon sequestration).[20] Examples of recent initiatives include the 2008 Comprehensive Framework for Action, produced by 2008 the United Nations High-Level Task Force on the Global Food Security Crisis as a guide for governments to engage in food and agricultural policy reform with emphasis on the support for smallholders as a mechanism for rural development and for creating more resilient food systems; the L'Aquila Food Security Initiative introduced by the G8 in 2009; and the Global Agriculture and Food Security Programme launched by the World Bank in 2009, which also stresses the importance of smallholder agriculture. In addition, the

[11] Feeding the world: sustainable management of natural resources, FAO, 2008 http://www.un.org/esa/sustdev/csd/csd16/documents/bp8_2008.pdf
[12] http://www.un.org/esa/sustdev/publications/trends2008/agriculture.pdf, p. 2
[13] Ibid.
[14] Ibid.
[15] Ibid. p. 3
[16] S. Akroyd and L. Smith (2007), "Review of public spending to agriculture", a joint DFID/World Bank study, Oxford Policy Management, January, pp. 2-3. http://www1.worldbank.org/publicsector/pe/pfma07/OPMReview.pdf
[17] Ibid.
[18] Ibid.
[19] http://www.un.org/esa/sustdev/publications/trends2008/agriculture.pdf, p. 4
[20] Rural Poverty Report, 2011, IFAD http://www.ifad.org/rpr2011/report/e/rpr2011.pdf

position of the state in rural development and agriculture is being reconsidered, and recently attention is being given to the role that public policies and investment can assume in reducing market instability and ensuring national food security.[21]

Global Initiatives to enhance Integrated Programming

As the lead agency for Chapter 14, the FAO initiated and provided the secretariat for the UN System Network on Rural Development and Food Security, an inter-agency mechanism comprised of 20 UN organizations that represents a global approach to addressing rural development challenges at the country level.[22] The secretariat is managed by the FAO, the international Fund for Agricultural Development (IFAD) and the World Food Programme (WFP). The FAO has additionally assisted in the launch of the 'Sustainable Agriculture and Rural Development Initiative' in 2002 as a partnership between governments and civil society,[23] established the Right to Food Unit, and worked with partners to develop and support the International Alliance Against Hunger and Malnutrition[24] in 2003, as an attempt to expedite action to reduce global food insecurity.

In 2009, the Committee on World Food Security (CFS) underwent a series of reforms designed to position it as 'the most inclusive international and intergovernmental platform for all stakeholders to work together to ensure food security and nutrition for all'.[25] The Committee's objectives include coordinating a global approach to food security, promoting policy convergence, and supporting and advising countries and regions.[26] Further international commitments addressing Chapter 14 include the adoption of the Millennium Development Goals (MDGs), specifically, MDG1 – to halve the proportion of people living in extreme poverty and hunger by 2015. Implementation of MDG1 at the national level has been promoted through poverty reduction strategies (PRSs) and national development strategies. However, PRSs – principally first-generation PRSs - paid limited attention to the rural economy, rural poverty and rural stakeholders.[27]

National and Regional Initiatives

Important regional and national level initiatives that address programme area (a) in Chapter 14 include: the adoption of the Maputo Declaration in 2003, aiming to increase funding in agriculture in Africa;[28] the NEPAD-coordinated Comprehensive African Agriculture Development Programme (2003), which addresses policy and capacity issues across the agricultural sector in Africa and aims to alleviate poverty and hunger through agriculture;[29] the 2008 launch by the South Asian Association for Regional Cooperation (SAARC) of the Colombo Declaration on Food Security, which called for a road map for agriculture development and food security and directed the delivery of a two-million-ton SAARC food bank to supply regional food reserves throughout food emergencies;[30] the implementation in 2008 by the Minister of Agriculture of the member countries of the Association of Southeast Asian Nations (ASEAN) of the ASEAN Integrated Food Security (AIFS) framework[31], which aims to achieve long-term food security and improve the livelihoods of farmers in the ASEAN region; the Commission on Family

[21] Ibid.
[22] http://www.rdfs.net/about/about_en.htm
[23] http://www.fao.org/wssd/SARD/SARD0_en.htm
[24] http://www.theaahm.org/about-aahm/en/
[25] http://www.fao.org/cfs/cfs-home/cfs-about/en/
[26] Ibid.
[27] Global Donor Platform for Rural Development, 2008, Sharpening the rural focus of poverty reduction strategies http://www.donorplatform.org/resources/library
[28] http://www.nepad.org/system/files/Maputo%20Declaration.pdf
[29] http://www.nepad.org/foodsecurity/agriculture/about
[30] http://www.saarc-sec.org/
[31] http://www.asean.org/22338.pdf

Farming MERCOSUR[32] (an IFAD, national Government and farmer collaboration), working in rural areas of the MERCOSUR countries – Argentina, Brazil, Paraguay and Uruguay – to increase investment in agriculture and rural development, strengthen national capacities for policy response to rural poverty, promote private-sector participation in agriculture, and encourage agricultural research.

The European Initiative for Sustainable Development in Agriculture (EISA) in 2010 published the revised European Integrated Farming Framework, which serves 'as a definition and in detail description of Integrated Farming (IF) as a guideline to sustainable development in European agriculture'.[33] For individual farmers, the document functions as 'a comprehensive management tool which may help to raise further awareness and continually improve everyday practice on farm in order to meet future environmental, economic and social challenges'.[34] For policymakers, it functions to guide potential policy incentives and therefore harmonize agricultural production performance across Europe.[35]

Organic farming

Since the introduction of Agenda 21, interest in organic farming has increased. Organic farming has reduced negative effects - upon ecosystems, the natural resource base, and the health of farmers – than conventional agriculture.[36] Organic farming also presents export opportunities for smallholders in developing countries – with relatively plentiful labour supply and with a small use of agrochemicals. Land under organic farming is rising, however, this growth is found within only a few countries.[37] Currently, 1% of agricultural land is managed under organic farming methods – 31 million hectares – by more than 600,000 farmers. The majority of organically managed land is contained within Oceania – predominantly due to actions within Australia -, Europe – mainly within the EU -, and Latin America – predominantly in Argentina, Brazil and Uruguay.[38] However, entering export niche markets remains a challenge to the poorest countries due to the lack of substantial investments required for certification bodies and markets and the low volumes of organic products that are traded.[39]

Ecological labelling schemes

Since the Rio Summit, ecological labelling schemes have emerged as a mechanism of mainstreaming sustainable development practices in agriculture. The Sustainable Agriculture Network (SAN) is a coalition of non-profit conservation and rural development groups that have sought to promote the adoption of common standards of sustainability through a labelling scheme overseen by the Rainforest Alliance. The SAN develops standards and Best Management Practices, and uses 'extensively trained specialists' to carry out farm audits based on these criteria; compliant producers are able to display the Rainforest Alliance Certified seal on their products.[40] Studies to ascertain the success of the scheme in promoting the uptake of sustainable practices are currently ongoing.[41]

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[32] http://www.ifad.org/operations/projects/regions/PL/factsheet/mercosur_e.pdf
[33] http://www.sustainable-agriculture.org/stuff/EISA-Framework-english-040810.pdf, p. 2
[34] Ibid.
[35] Ibid.
[36] Tends, Land, p20 http://www.un.org/esa/sustdev/publications/trends2008/land.pdf
[37] Ibid.
[38] International Federation of Organic Agriculture (IFOAM) and Research Institute of Organic Agriculture (FiBL) (2007) The World of Organic Agriculture: Statistics & Emerging Trends 2007, p196 http://orgprints.org/10506/1/willer-yussefi-2007-p1-44.pdf
[39] M. A. Altieri, P. Rosset and L. A. Thrupp (2001), The potential of agroecology to combat hunger in the developing world, chapter 19 in The Unfinished Agenda: Perspectives on Overcoming Hunger, Poverty, and Environmental Degradation, P. Pinstrup-Andersen and R. Pandya-Lorch, eds., IFPRI, p123 http://pdf.usaid.gov/pdf_docs/PNACM470.pdf
[40] http://www.rainforest-alliance.org/sites/default/files/site-documents/marketing/seal-guidelines-agriculture.pdf, p. 2
[41] http://www.rainforest-alliance.org/work/impact/projects

Chapter 14 recognised the need to conserve the genetic resources of both plants and animals in order to meet future global food requirements in a sustainable manner. This is being increasingly important when considering the impacts of climate change – increasing levels of natural disasters, pests and diseases. Throughout history humans have used approximately 10, 000 plant species for food, yet, now just 20 crops provide 90 percent of dietary energy or protein. Specifically, wheat, rice and maize supply over half of the worldwide plant-derived energy intake[42]. A large proportion of crop genetic diversity exists in the form of traditional varieties conserved – in-situ - on small-scale farm land. However, modern agriculture has resulted in farmers to abandon traditional and heterogeneous crop varieties for new and often uniform varieties. Such in-situ erosion presents significant threats to long-term global food security. Ex-situ seed banks have been important in implementing programme area (g), important initiatives include: The Global Crop Diversity Trust (GCDT), which aims to conserve and make accessible numerous crop varieties through supporting seed banks, especially within the developing countries; the Millennium Seed Bank Project, an international conservation project coordinated by the Kew Royal Botanical Gardens; research centres of the Consultative Group on International Agricultural Research preserve more than 600,000 samples of crop, forage and agro-forestry genetic resources, accessible in the public domain. Its seed collections have facilitated in the revival of agricultural growth in numerous countries (name) after natural disasters and conflicts[43]. At the national level – in Kenya and Zimbabwe - the use of local and traditional breeds have been promoted through annual seed fairs, where farmers can obtain rare crop varieties, identify seed sources and exchange seeds[44].

Animal genetic resources for food and sustainable agriculture have deteriorated at an increasing rate since the adoption of Agenda 21. There remains considerable disjunction in national capacity of counties – particularly in developing countries – to manage the animal genetic resources in an integrated manner[45]. For example, the International Livestock Research Institute in Kenya has called for gene banks similar to the GCDT to conserve livestock and genetic diversity[46].

Genetic modification of plant resources – particularly for species of cotton, soybean, maize and rapeseed - has sometimes brought benefits of increasing yields, reducing growing periods, and increasing levels of resistance to pests and diseases – enhancing crop production, reducing hunger and generating income for famers[47,48]. However, genetic modification remains a highly controversial issue, with its risks to the environment, biological diversity and human and animal health essentially unknown. The issue of genetically modified organisms is discussed in the analysis of Chapter 16 of Agenda 21.

Challenges and Conflicts

The renewed focus by Governments, international organisations and public and private initiatives on agriculture as a mechanism for sustainable rural development is encouraging. However,

[42] United Nations Economic and Social Council, Report of the Secretary General: Agriculture, 2008 http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/250/32/PDF/N0825032.pdf?OpenElement
[43] www.cgiar.org
[44] Practical Action. 2002. Preserving the web of life. World Summit on Sustainable Development. Johannesburg, South Africa. http://practicalaction.org/wssd_web_of_life
[45] FAO, The State of the World's Animal Genetic Resources for Food and Agriculture, 2007 http://www.fao.org/docrep/010/a1250e/a1250e00.htm
[46] International Livestock Research Institute (ILRI) 2007. A 'livestock meltdown' is occurring as hardy African, Asian, and Latin American farm animals face extinction http://www.ilri.org/ilrinews/index.php/archives/550
[47] United Nations Economic and Social Council, Report of the Secretary General: Agriculture, 2008 http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/250/32/PDF/N0825032.pdf?OpenElement
[48] p68-70 http://www.ifad.org/poverty/region/pi/PI_part2.pdf

significant challenges for the implementation of Chapter 14 remain, particularly in light of climate change and increases in global population projections, increasing resource scarcity, higher energy prices, increasingly volatile food prices, growing insecurity of access to land, and new market demands, for example, bio-fuels.

Resource scarcity & growing demand

Growth in economies and rising income levels have led to diets moving towards higher energy-intensive foods, for example, meat and dairy products[49]. These challenges are particularly apparent in Africa, with food security deteriorating since UNCED, food exports decreasing and expensive food imports increasing - of the 36 countries currently identified by FAO as requiring external assistance to cope with significant food insecurity, 21 are within Africa[50]. Many of the challenges discussed relate to and are also discussed in the analysis of Chapter 10 of Agenda 21, on the integrated approach to the planning and management of land resources.

The increasing demand placed on natural resources and their increasing scarcity is a foremost challenge in achieving the programme areas outlined in Chapter 14 of Agenda 21, particularly in terms of reducing food insecurity and rural development. The EU's 2009 sustainable development monitoring report noted a 5.4% increase in total artificial surfaces from 1990 to 2000, representing a significant encroachment on potentially land in the region.[51] Moreover, a 2008 GLADA report noted that 24 per cent of the global land area suffered from degradation recorded from 1981-2003, and that almost one fifth of degrading land is cropland.[52]

Foreign Land purchases

Private investors and governments have recently stepped up foreign investment in farmland in the form of purchases or long-term lease of large tracks of arable land, notably in Africa. This trend has had a number of implications for sustainable development, including legal, social, economic and environmental issues. Importantly, the new investment strategy is more strongly driven by food, water and energy security than a notion of comparative advantage in the large scale production of indigenous crops for global markets, which has been more characteristic of foreign-owned plantations since the end of the colonial era. The current land purchase and lease arrangements are about shifting land and water uses from local farming to essentially long-distance farming to meet home state food and energy needs. It is, in practice, purchasing food production facilities. The growing scale of this practice today, combined with the increasing economic and environmental concerns that are motivating this surge, are creating a new dynamic of global importance. It is no longer just the crops that are commodities: rather, it is the land and water for agriculture themselves that are increasingly becoming commodified, with a global market in developing country land and water rights being created and, increasingly, subject to claims for globalized rights of access. Further, these proposed investments often have little relevance to a country's domestic plans to develop the agriculture sector, when such plans exist. These developments are creating risks that local food needs, and land and water users, will be displaced.[53]

[49] iied (2011) Food security in 2050: how can we make it fairer and more sustainable? http://www.iied.org/sustainable-markets/blog/food-security-2050-how-can-we-make-it-fairer-and-more-sustainable [accessed 13/07/2011]
[50] FAO, Crop prospects and Food situation, No 1. (2008) p2 http://www.fao.org/docrep/012/ak343e/ak343e00.pdf
[51] http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-78-09-865/EN/KS-78-09-865-EN.PDF, p. 165
[52] http://www.isric.nl/ISRIC/webdocs/docs/report%202008_01_glada%20international_rev_nov%202008.pdf, p. i
[53] UN-DESA, 2010, Foreign land purchases for agriculture: what impact on sustainable development?, *Sustainable Development innovation Brief*, 8, January.

Water scarcity represents a further challenge to efforts to meet the objectives outlined in Chapter 14, given that agriculture accounts for around 70% of global water usage.[54] An increase in global food production will most likely have to be achieved without a corresponding increase in water consumption, due to pressure from growing urbanisation, industrialisation and climate change.[55] This challenge is particularly apparent in terms of smallholder farming and in light of climate change impacts. Degradation of the natural resource base exposes the land making it increasingly vulnerable to climate change and extreme weather events[56].

Climate change

While agriculture has traditionally been able to adapt gradually to environmental changes and variances in climate, the recent pace and intensity of climate change is outpacing smallholders' ability to adapt.[57] Climate change will decrease agricultural production and production potential in many parts of the world due to reductions in natural resources, increased temperatures and changes in growing seasons and the increase in new pests and diseases[58]. Climate change and the resulting extreme weather events act as 'risk multipliers' relating to natural resource degradation, since they aggravate the vulnerability of the natural resource base and as climate change mitigation policies increase demands on land for biofuels. Such aggravation is common in exposed and susceptible environments – of which the rural poor often inhabit – such as, those prone to desertification and degradation, areas under water stress, areas of steep slopes, low-lying areas and those areas in which poverty weakens the rural poor's capacity precautionary measures.[59]

Scenario work conducted by IFPRI predicts that agricultural yields and agricultural incomes will fall, particularly in South Asia as a result of temperature changes.[60] Alternative research has suggested that Africa will be the continent most affected by climate change in the context of agriculture, with almost all countries undergoing losses of productivity. Increased temperatures and new rainfall patterns will dramatically change the geographical distribution of areas appropriate to the production of certain crops, meaning that maintaining the present crop mix would result in suboptimal yields.[61] Moreover, the World Food Programme (WFP) has predicted that 65 percent of climate-associated hunger will be in Africa, 'with a projected 10 million (26 percent) increase in the number of malnourished children in 2050 compared with a no-climate-change scenario'.[62]

Lack of access to markets and poor infrastructure

In Africa, lack of access to markets represents a considerable capacity constraint across most of the continent.[63] An absence of suitable transport infrastructure also constitutes a problem.[64] Countries with low population densities are more likely to suffer from insufficient road networks, rendering access to markets from rural areas problematic.[65] Other infrastructural problems present

[54] http://www.oecd.org/document/55/0,3746,en_2649_37401_44753399_1_1_1_37401,00.html
[55] http://www.oecd.org/dataoecd/15/16/48498988.pdf
[56] International Fund for Agricultural Development (IFAD), Rural Poverty Report, (2011), p83 http://www.ifad.org/rpr2011/report/e/rpr2011.pdf
[57] http://www.ifad.org/climate/factsheet/climate_e.pdf, p. 1
[58] International Fund for Agricultural Development (IFAD), Rural Poverty Report, (2011), p84 http://www.ifad.org/rpr2011/report/e/rpr2011.pdf
[59] Ibid. p. 83
[60] Nelson, G.C., M.W. Rosegrant, J. Koo, R. Robertson, T. Sulser, T. Zhu, C. Ringler, S. Msangi, A. Palazzo, M. Batka, M. Magalhaes, R. Valmonte-Santos, M. Ewing, and D. Lee. (2009). Climate change: Impact on agriculture and costs of adaptation. Washington, D.C.: International Food Policy Research Institute, p4 http://www.ifpri.org/sites/default/files/publications/pr21.pdf
[61] http://www.un.org/esa/sustdev/publications/trends_africa2008/fullreport.pdf, p. 45
[62] http://documents.wfp.org/stellent/groups/public/documents/newsroom/wfp212536.pdf, pp. 12-4
[63] http://www.un.org/esa/sustdev/publications/trends_africa2008/fullreport.pdf, p. 29
[64] Ibid.
[65] http://www.un.org/esa/sustdev/publications/trends_africa2008/fullreport.pdf, p. 17

in Africa include sanitary and phytosanitary (SPS) standards, poorly funded research and development, weak links to global supply chains, and poor logistics infrastructure.[66]

Price volatility

The majority of agricultural commodity markets suffer from price volatility, due primarily to natural shocks; limited demand and supply elasticity necessitating price rises in the event of supply shocks; and long production cycles preventing adaption to price changes in the short term.[67] In developing countries, weather shocks, pests and other natural calamities are felt particularly keenly due to poorly functioning markets that might otherwise respond to price rises. Tackling this problem would necessitate investing in infrastructure and institutions for more efficient markets, eliminating trade restrictions such as tariffs, and enhancing market transparency.[68]

Way Forward

Progress over the next decade is likely to be contingent on success in several key areas, the following among them. The fairness of agricultural markets has to be recognized as a significant concern, particularly with regard to tariffs and subsidies. The agricultural sector itself has been the biggest barrier to progress, delaying the WTO Uruguay Round of trade negotiations and stalling the current Doha Round. Agricultural support in OECD plays a key role in distorting international markets, although declining levels of distortion have been noted since the Uruguay Round due to the fact that 'subsidies directly attached […] to production have gradually been reduced and substituted by measures that support farmers' incomes and reduce their risk exposure'.[69] Tariffs, however, represent a far greater distorting force; estimates suggest that 'import tariff barriers represent 81.4 percent of total support to agriculture in all countries'.[70] Developing countries suffer particularly from the market distortions brought about by such tariff measures. The trend in recent years has been towards a more open system with fewer impediments to developing countries' access to international agricultural markets, but the fear is that the lack of progress in the Doha Round could slow or reverse the pace of reform.[71]

Biofuels represent another key area in which progress will have to be made, as biofuel production is currently increasing around the world due to subsidies and targets set by national governments.[72] In 2008, about 80 to 85 million tonnes of cereals were used in the production of ethanol, a scenario expected to push up international food prices.[73] The severity of the impact of biofuels on food prices is likely to be contingent 'on the aggregate share that first-generation biofuels are mandated to contribute to total transport fuel consumption'.[74] As consumption in developing countries is less elastic than in developed regions, the projected price rises are likely to be felt more keenly, entailing a considerable risk of hunger and undernourishment.[75] Developing policies which alleviate the potential impacts of increased biofuel production on global food prices and the developing world in particular will be a key priority for decision makers.

[66] Ibid. p. 21
[67] Agricultural Policy Monitoring and Evaluation 2011, OECD Publishing, p. 37
[68] Ibid.
[69] Looking Ahead in World Food and Agriculture, FAO, p. 530 http://www.fao.org/docrep/014/i2280e/i2280e.pdf
[70] Ibid. p. 531
[71] Ibid. p. 534
[72] Ibid. pp. 116, 118
[73] Ibid. p. 127
[74] Ibid. p. 129
[75] Ibid. pp. 129, 131

Finally, coping with food price volatility generally will be central to the efforts of policy makers, with regard to the risks posed by both rising prices to consumers and falling prices to farmers. Short episodes of high prices for poor consumers or low prices for smallholder farmers can cause productive assets to be sold at low prices, leading to possible poverty traps and having a long-term impact on development. This being said, the high food prices recorded at present represent a considerable opportunity for long-term investment in agriculture, which will be critical to long-term food security. An appropriate policy framework is therefore essential.[76]

[76] http://www.fao.org/docrep/014/i2330e/i2330e.pdf

Chapter 15: Conservation of biological diversity

Introduction

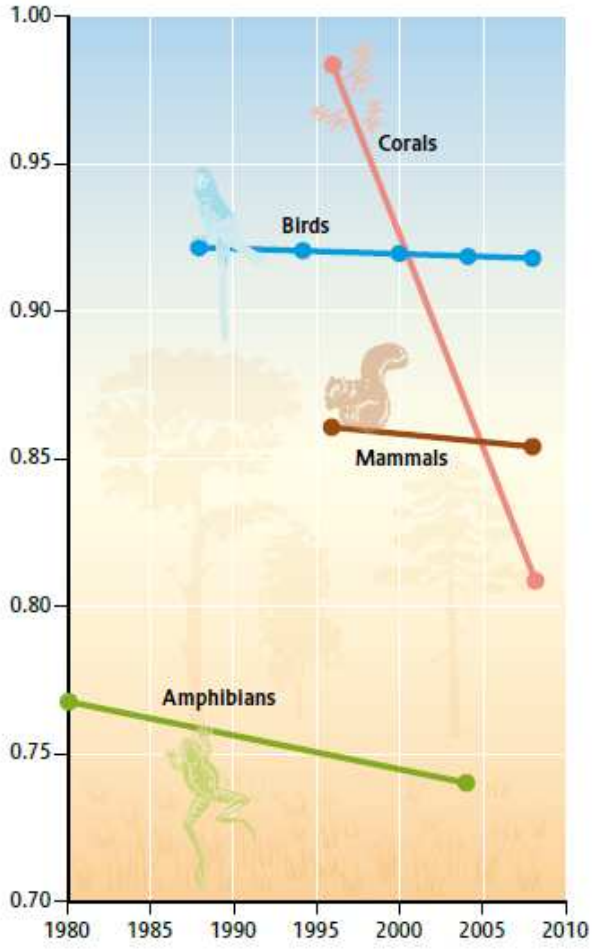
Agenda 21 recognized that the world's biodiversity was decreasing despite nearly 20 years of efforts to reverse it, beginning with international commitments to address biodiversity at the Stockholm Conference on the Human Environment in 1972. Deforestation, over-exploitation of natural resources and environmental pollution were leading to habitat loss and extinctions both on land and in the sea. Since healthy ecosystems are vital for human development and survival, the Convention on Biological Diversity (CBD) was agreed and signed at the Rio Summit in 1992. Chapter 15 had one programme which was to conserve biological diversity by putting into force the Convention on Biological Diversity, national strategies and reporting, fair and equitable sharing of benefits, preserving traditional knowledge, creating a framework for biotechnology use and transfer and producing a periodic global report.

Implementation

Conservation of Biological Diversity

In the 20 years since the Rio Summit, biological diversity has continued to decline in three main areas: ecosystems, genes and species.1 Prognosis for biodiversity is grim with high levels of extinction expected to occur over the next hundred years.2 The underlying drivers of biodiversity loss continue to increase and efforts have not had a significant impact. Ecosystems are being lost due to economic and industrial development, agriculture expansion, and deforestation (half of which is illegal).3 The genetic diversity of crops and livestock is decreasing and plants and organisms are being driven to extinction.4 Twenty-five percent of plant species are threatened with extinction, while the rate of extinction for warm water corals and amphibians is increasing rapidly (See figure 1).5 Loss of biological diversity is not evenly spread. Developed countries are beginning to see recoveries in their biological diversity due to increased environmental awareness and effective policies.6 Sub-Saharan Africa saw its biological diversity dip to its lowest level in the mid 1990s, but it too is beginning to see signs of recovery (see figure 2)7. Latin America and Indo-Pacific regions are witnessing steep decline in biological diversity (see figure 3, 4 all courtesy of Living Planet Report 2010).8 International negotiations and agreements have been acrimonious with a clear North-South divide that has hampered efforts.

[1]Secretariat of the Convention on Biological Diversity (2010) Global Biodiversity Outlook 3. Montréal accessed at http://gbo3.cbd.int/ page 9
[2]Secretariat of the Convention on Biological Diversity (2010) Global Biodiversity Outlook 3. Montréal accessed at http://gbo3.cbd.int/ page 11
[3] Michael R. W. Rands, William M. Adams, Leon Bennun, Stuart H. M. Butchart, Andrew Clements, David Coomes, Abigail Entwistle, Ian Hodge, Valerie Kapos, Jörn P. W. Scharlemann, William J. Sutherland and BhaskarVira, "Biodiversity Conservation: Challenges Beyond 2010", Science, 10 September 2010, Vol. 329(5997), page 1299
[4]Secretariat of the Convention on Biological Diversity (2010) Global Biodiversity Outlook 3. Montréal accessed at http://gbo3.cbd.int/ page 9
[5]Secretariat of the Convention on Biological Diversity (2010) Global Biodiversity Outlook 3. Montréal accessed at http://gbo3.cbd.int/ page 9 and page 26
[6] Duncan Pollard (Ed), Living Planet Report 2010 Biodiversity, biocapacity and development, (Gland: WWF International, 2010) accessed at http://wwf.panda.org/about_our_earth/all_publications/living_planet_report/ page 16
[7] Ibid
[8] ibid



The proportion of warm-water coral, bird, mammal and amphibian species expected to survive into the near future without additional conservation actions has declined over time. The Red List Index (RLI) for all these species groups is decreasing. Coral species are moving most rapidly towards greater extinction risk, while amphibians are, on average, the group most threatened.

A Red List Index value of 1.0 indicates that all species in a group would be considered as being of Least Concern, that is not expected to become extinct in the near future. At the other extreme, a value of 0 indicates that all species in a group have gone extinct. A constant level of the index over time implies that the extinction risk of species is constant, and if the rate of biodiversity loss were reducing, the lines on this figure would show an upward slope.

Source: IUCN

Figure 1: Decline of Species by Group courtesy of Global Biodiversity Outlook 4

Despite the downward decline, efforts have been made at all levels to protect and preserve biodiversity. The CBD has 193 parties, 170 of which have national biodiversity action plans.[9] In addition, the convention has a centralised clearing house mechanism hosted through the CBD website, consisting of 196 national clearing houses, 91 of which have websites – the clearing houses provide up-to-date information on biodiversity related analysis and activities in respective nations. The number of protected areas globally has increased 2.5% per year since 1992 to a total of 24 million km^2 in 133,000 sites.[10]

[9]Secretariat of the Convention on Biological Diversity (2010) Global Biodiversity Outlook 3. Montréal accessed at http://gbo3.cbd.int/ page 20

[10] Michael R. W. Rands, William M. Adams, Leon Bennun, Stuart H. M. Butchart, Andrew Clements, David Coomes, Abigail Entwistle, Ian Hodge, Valerie Kapos, Jörn P. W. Scharlemann, William J. Sutherland and BhaskarVira, "Biodiversity Conservation: Challenges Beyond 2010", Science, 10 September 2010, Vol. 329(5997), page 1299

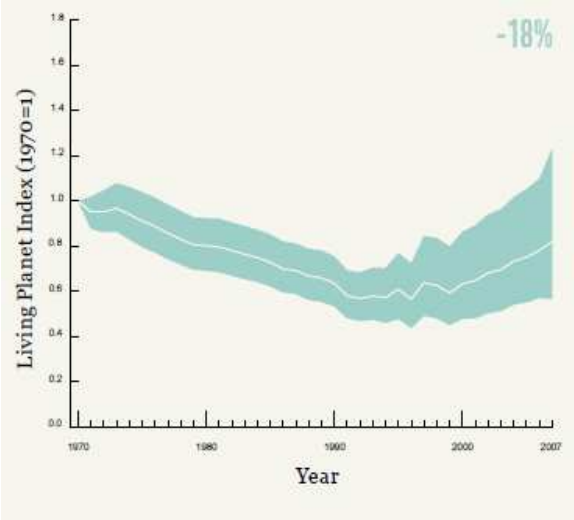


Figure 2: Decline in Biodiversity since 1970 in Sub-Saharan Africa

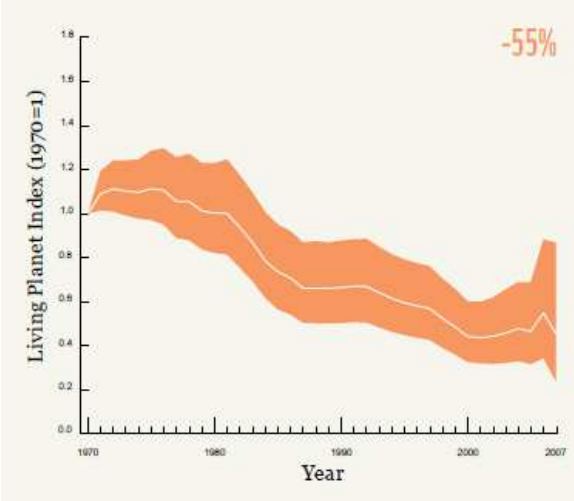


Figure 3: Decline in Biodiversity since 1970 in Latin America

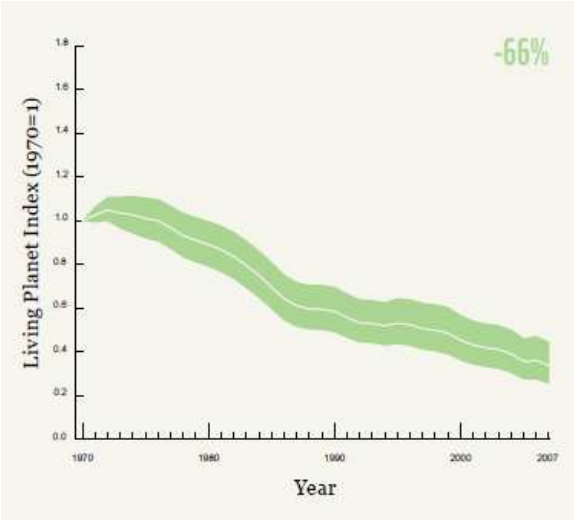


Figure 4: Decline in Biodiversity since 1970 in Indo-Pacific

The parties to the Convention of Biological Diversity agreed in 2002 to set a target of "a significant reduction of the current rate of biodiversity loss at the global, regional and national level" by 2010. The target was implemented through a framework comprising 7 focal areas and associated goals and sub-targets. The focal areas included: reducing the rate of loss of the components of biodiversity; promoting sustainable use of biodiversity; addressing the major threats to biodiversity; maintaining ecosystem integrity; protecting traditional knowledge, innovations and practices; ensuring the fair and equitable sharing of benefits arising out of the use of genetic resources; and mobilising financial and technical resources. The Global Biodiversity Outlook is a publication that analyses progress toward the 2010 target. The third edition published in 2010 noted that none of the 11 goals and 22 sub-targets were met globally by 2010. Some of the targets were met at a national or local level.[11] Three sub-targets saw no progress: unsustainable consumption of biological resources (or that which impacts upon biodiversity) increased; biological resources that support sustainable livelihoods, local food security and health care continued to decline; and protection of traditional knowledge, innovations and practices also saw a decline.[12]

Environmental Impact Assessments are being used by most countries and there has been an increase in public awareness campaigns, research and monitoring.[13] Article 6 of the CBD required parties to complete national biodiversity strategies and action plans and 173 countries have done so. Progress in implementing the convention is reported to the Secretariat through a national reporting scheme. The fourth national report was due in 2009 and 165 of the 193 parties to the convention submitted them. In light of the progress toward the 2010 target, the parties to the CBD agreed to a new Strategic Plan for Biodiversity 2011 to 2020. The Strategic Plan includes 5 goals and 20 Aichi biodiversity targets.[14]

Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society
Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use
Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity
Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services
Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building

Shifts in conservation approaches
In the last few decades since the Agenda 21, we have moved from a narrow understanding of conservation towards a more inclusive approach that reflects ecological, socioeconomic and governance dimensions, along with which policy processes have become increasingly complex. The success in addressing these challenges depends largely on creating coherent and realistic policies and enabling sound governance.

A shift has taken place from state forest management to multi-stakeholder engagement. India, Nepal and the Philippines have been identified as leading in the implementation of 'participatory forestry' and allocation of forestlands and rights to households, individuals and private entities

[11]Secretariat of the Convention on Biological Diversity (2010) Global Biodiversity Outlook 3. Montréal accessed at http://gbo3.cbd.int/ page 17-19
[12] Ibid page 18-19.
[13]Secretariat of the Convention on Biological Diversity (2010) Global Biodiversity Outlook 3. Montréal accessed at http://gbo3.cbd.int/ page1 7
[14] Key elements of the Strategic Plan 2011- 2020, including Aichi Biodiversity Targets. Convention on Biological diversity, Available at: http://www.cbd.int/sp/elements/

have been progressing in China and Viet Nam[15]. Conservation paradigms, practices and policies have shifted over time, in the recent decades; traditional approaches to conservation have evolved to encompass awareness of the diverse benefits provided by protected areas, the importance of local conservation initiatives and interests in protected area management, and the need to address the opportunity costs of conservation among the rural poor.[16] Protected areas have been discovered to work towards ensuring natural resource management, conservation of biodiversity and also as part of poverty alleviation strategies. A model that is gaining increasing success is based on the concept of integrating conservation and development and aims to provide greater management responsibility to the local community for e.g. the Annapurna Conservation Area (ACA) in Nepal managed by National Trust for Nature Conservation (NTNC) contributed to pioneer this approach, thus resulting in a paradigm shift in Protected Area (PA) management.[17] Until lately the public sector was mainly responsible for protected area management, however, recent cutbacks in public sector expenditure have severely undermined the public sector management approach. There is mounting pressure worldwide to open up avenues for more innovative market driven ideas.[18]

International and regional cooperation and coordination

The Cartagena Protocol on Biosafety came into force in 2004 and has 161 parties. It is a protocol of the CBD and addresses the movement of living modified organisms (LMO) which have the potential of negatively impacting biodiversity. The protocol has seen a standoff between countries who advocate free movement of LMOs and those who want to establish risk assessments and procedures.[19] The Protocol was finally completed in late 2010 with the adoption of an international regime on liability and redress. Countries not party to the Protocol include Australia, Canada, and USA - where most of the top 100 biotechnology companies are based.

The International Treaty on Plant Genetic Resources for Food Agriculture has 127 parties and came into force in 2004. In early 2011, it finally adopted compliance procedures and rules regarding funding for the secretariat. Contentious issues surrounding the Multilateral System, which was to pool together the genes of 64 crops, remain.[20] In 2007, the Global Plan of Action for Animal Genetic Resources and the Interlaken Declaration was adopted by 109 countries to address the decrease in livestock genetic diversity. Other negotiated treaties include the Convention on International Trade in Endangered Species of Wild Fauna and Flora, the Convention to Combat Desertification, and the Ramsar Convention (Wetlands).

Challenges and Conflicts

Funding

The tenth Conference of Parties of the CBD, which took place in Nagoya, Japan in November 2010 highlighted several important challenges to conserving biodiversity at the international level. While developed countries called for strong biodiversity targets, developing countries resisted, stating that without sufficient funding to implement those targets, there would be no benefit in setting them.[21]The CBD financial mechanism, the Global Environmental Facility,

[15] http://www.unescap.org/stat/data/syb2011/II-Environment/Biodiversity-protected-area-and-forests.pdf
[16] http://www.unep-wcmc.org/medialibrary/2010/11/03/32b12e39/ChallengesBeyond2010.pdf
[17] http://www.ntnc.org.np/sites/default/files/publicaations/Book_Final_Verson.pdf
[18] http://www.ntnc.org.np/sites/default/files/publicaations/Book_Final_Verson.pdf
[19] Johannes Gnann, Stefan Jungcurt, TallashKantai, Dorothy WanjaNyingi, Eugenia Recio, and Liz Willetts, Summary of the fifth meeting of the parties to the Cartagena Protocol on Biosafety: 11-15 October 2010, Earth Negotiations Bulletin, Vol 9:533 accessed at http://www.iisd.ca/biodiv/bs-copmop5/ page 14
[20]TallashKantai, Delia Paul, Nicole Schabus, and Elsa Tsioumani, Summary of the fourth session of the governing body of the International Treaty on Plant Genetic Resources for Food and Agriculture: 14-18 March 2011 Earth Negotiations Bulletin, Vol 9:550 accessed at http://www.iisd.ca/biodiv/itpgrgb4/ page 15
[21] Stefan Jungcurt, TallashKantai, Elisa Morgera, Eugenia Recio, Nicole Schabus, and Elsa Tsioumani, Summary of the tenth conference

provides 100-200 million US dollars annually for biodiversity projects.[22] In addition, Bilateral Assistance has increased slowly since 1992 to 4.3 billion US dollars in 2009. NGOs, representing the next most important source of funding, pledged 1 billion US dollars for biodiversity-related projects and programmes for the year 2004.[23] Overall, international financial investment has increased 38% in real terms between 1992 and 2006. Yet despite the increases in funding in real terms, the overall level of funding remains insufficient to meet the necessary levels of biodiversity conservation.[24] The Nagoya Protocol includes a Strategy for Resource Mobilisation; however, developing countries are keen to secure quantitative targets on financing that specify the necessary level of assistance, accompanied by a monitoring mechanism which tracks funds committed and dispersed.[25] On the other hand, developed countries argue that they cannot commit to specific amounts. Nevertheless, they insist a necessary first step would be to quantify the financial shortfall in each country in implementing the biodiversity targets through baseline assessments and the implementation of national biodiversity reporting and accounting systems.[26] To cope with the shortfall in funding, developed countries are proposing innovative financial mechanisms that would leverage additional funds from the private sector[27]. Examples of innovative financing recently explored by the CBD include payment for ecosystem services based on a beneficiary pays system; a biodiversity offset mechanism based on a polluter pays system; environmental fiscal reform such as taxation policies; creating markets for green products; and international financial mechanisms such as a global lottery (harnessing the world lottery market), global bonds and trust funds, public guarantees and insurance mechanisms, equity investments, green development mechanism and currency transaction tax.[28] Developing countries are wary of this option as it may impose costs on them. For example, through polluter pays policies and result in a decrease in bilateral assistance as developed countries move away from public funding and push private sector funding.[29]

Access and Benefit Sharing

A second major challenge is operationalising equal access and benefit sharing (ABS) of global biological and genetic resources; a major potential source of funding for developing countries. "The fair and equitable sharing of the benefits arising out of the utilization of genetic resources…" is the third objective of the Convention of Biological Diversity. The person/company seeking access to a resource must gain prior informed consent and share the benefits of the use of that resource on mutually agreed terms. For example, a community in Africa uses a plant for the treatment of diabetes, a company may wish to do research on the plant and identify the active agents, on discovering them, it patents the agents for commercialisation without benefiting the original community. The company and developed country where it is

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of the parties to the Convention on Biological Diversity: 18-29 October 2010, Earth Negotiations Bulletin, Vol 9:544 accessed at http://www.iisd.ca/biodiv/cop10/ page 9

[22] Secretariat of the Convention on Biological Diversity (2010) Global Monitoring Report 2010 – Innovative Financing for Biodiversity Montreal accessed at http://www.cbd.int/financial/doc/global-monitoring-report-2010-en.pdf page 17

[23] Ibid. Page 31; "Time Series for Rio Marker," OECD website, accessed at http://www.oecd.org/document/6/0,3746,en_2649_34421_43843462_1_1_1_1,00.html

[24] Michael R. W. Rands, William M. Adams, Leon Bennun, Stuart H. M. Butchart, Andrew Clements, David Coomes, Abigail Entwistle, Ian Hodge, Valerie Kapos, Jörn P. W. Scharlemann, William J. Sutherland and BhaskarVira, "Biodiversity Conservation: Challenges Beyond 2010", Science, 10 September 2010, Vol. 329(5997), page 1300

[25] Stefan Jungcurt, TallashKantai, Elisa Morgera, Eugenia Recio, Nicole Schabus, and Elsa Tsioumani, Summary of the tenth conference of the parties to the Convention on Biological Diversity: 18-29 October 2010, Earth Negotiations Bulletin, Vol 9:544 accessed at http://www.iisd.ca/biodiv/cop10/ page 13

[26] Ibid.

[27] Ibid. Page 14

[28] For more information see Ad Hoc Open-Ended Working Group On Review Of Implementation Of The Convention, "Policy Options Concerning Innovative Financial Mechanisms", presented at the Third meeting in Nairobi, Kenya, 24-28 May 2010 accessed at http://www.cbd.int/doc/meetings/wgri/wgri-03/official/wgri-03-08-en.pdf

[29] Ibid; Stefan Jungcurt, TallashKantai, Chad Monfreda, Elisa Morgera, Eugenia Recio, Nicole Schabus, and Elsa TsioumaniCBD COP 10 highlights
Wednesday, 27 October 2010, Earth Negotiations Bulletin, Vol 9:542 accessed at http://www.iisd.ca/biodiv/cop10/

located has gained financially while the developing country has lost a potential source of revenue due to lack of capability and resources. ABS is an objective of Chapter 15 of Agenda 21, but it has caused significant conflict at the international level between developed and developing countries. The conflict centres on several issues. One is historical debt, i.e. whether genetic resources, derivatives and knowledge acquired without sharing the benefits should be compensated. Developing countries are in favour of this approach, whilst developed countries refuse to support any agreement for historical compensation.[30] The second issue is whether prior informed consent should be a legal obligation. Developing countries insist that it should be mandatory even if the provider country lacks national legislation; developed countries state that it should only be required if national legislation is present.[31]A further issue is whether there should be one regime to cover all biological and genetic materials or different regimes addressing specific areas, such as marine genetic resources, pathogens or animal breeding. Developing countries favour an all-encompassing regime to ensure consistency while developed countries would like to see the needs of different users addressed through separate regimes.[32]ABS touches upon a number of international regimes including the Trade-Related Intellectual Property Rights Regime. Currently traditional knowledge is being negotiated at the Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore of the World Intellectual Property Organization and negotiations on access to pathogenic genetic resources at the WHO have stalled.[33]Debate continues on which forum is most appropriate, especially in light of the fact the US, the largest producer of biotechnology, is not party to the CBD and if separate regimes are negotiated there are questions as to how they will interact.[34] Developed countries are in favour of having other forums dealing with specific issues such as traditional knowledge, while developing countries insist on these issues being addressed together under CBD.

Compliance with ABS regime of CBD is another source of contention. It was agreed at the Nagoya Conference that an internationally recognized certificate of Origin/Source/Legal Provenance should be used for monitoring the use of genetic resources. Developing countries proposed that patent offices should check for certificates, to ensure that prior informed consent has been obtained, and benefit sharing is occurring.[35] Developed countries felt that this would overburden patent offices, lead to increased time and costs and set up obstacles to the TRIPS agreement.[36]The Nagoya Protocol only states that 'designated checkpoints' collect and verify certificates to ensure benefit sharing.[37]

Another issue is whether or not derivatives should be included and how to manage their use beyond traditional knowledge. Examples of derivatives include genes, seeds, resin and blood taken from a biological or genetic source. However, no agreement has been achieved

[30] Stefan Jungcurt, Elisa Morgera, Eugenia Recio, Nicole Schabus, and Elsa Tsioumani, Summary of the resumed ninth meeting of the working group on access and benefit-sharing of the Convention on Biological Diversity: 10-16 July 2010, Earth Negotiations Bulletin, Vol 9:27 accessed at http://www.iisd.ca/biodiv/rabs9/ page 15
[31] Ibid.
[32] Ibid.
[33] Ibid; Frederick M. Abbott, "Pathogens Materials: coherence as an operational challenge for WHO, the CBD ABS regime and TRIPS", presented at WTO PUBLIC FORUM 2010 September 17, 2010 accessed at http://www.frederickabbott.com/uploads/Abbott-WTO-Pathogens_Materials.pdf
[34] Frederick M. Abbott, "Pathogens Materials: coherence as an operational challenge for WHO, the CBD ABS regime and TRIPS", presented at WTO PUBLIC FORUM 2010 September 17, 2010 accessed at http://www.frederickabbott.com/uploads/Abbott-WTO-Pathogens_Materials.pdf
[35]Stefan Jungcurt, Elisa Morgera, Eugenia Recio, Nicole Schabus, and Elsa Tsioumani, Summary of the resumed ninth meeting of the working group on access and benefit-sharing of the Convention on Biological Diversity: 10-16 July 2010, Earth Negotiations Bulletin, Vol 9:27 accessed at http://www.iisd.ca/biodiv/rabs9/ page 15.
[36] Ibid.
[37] Stefan Jungcurt, TallashKantai, Elisa Morgera, Eugenia Recio, Nicole Schabus, and Elsa Tsioumani, Summary of the tenth conference of the parties to the Convention on Biological Diversity: 18-29 October 2010, Earth Negotiations Bulletin, Vol 9:544 accessed at http://www.iisd.ca/biodiv/cop10/Page 4,7 and 26

internationally on what a derivative is.[38] Derivatives can be collected and marketed according to their traditional use, or use modified traditional knowledge, or be used for further research by pharmaceutical or biotechnology companies which may eventually give rise to a new use different from the traditional use.[39] Challenges surround when the benefit sharing agreement ends in particular with regard to creation of new uses from derivatives.[40]

Lack of Knowledge

A further significant challenge to biodiversity conservation is the lack of knowledge – or recorded knowledge – on the vast range of existing biodiversity globally. New species continue to be discovered each year and new populations located. Knowledge of ecosystem functions and how ecosystems react to changes is little understood.[41]The lack of knowledge also reflects a North-South divide, with temperate ecosystems better understood than tropical ones[42] - a possible consequence of scientific capacity being highly developed and concentrated in developed countries.[43] Scientific capacity is not equally shared across the globe, and is concentrated in rich developed countries rather than in the regions that face the most substantial challenges to maintaining and enhancing biodiversity. In addition to lack of scientific information, there is an overall lack of awareness of the importance of biodiversity among policy-makers and the wider public. Policy-makers commonly undervalue biodiversity when formulating government policies in areas such as agriculture, fisheries, and industry.[44]The result is the use of perverse subsidies, limited development of economic incentive measures and insufficient allocation of human and financial resources to biodiversity activities.[45] Furthermore, the public lack the knowledge to make demands of their government for better biodiversity regulations and conservation efforts.

Table 1: Issues identified as high- or medium-level challenges in third national reports by 70% or more of Parties in each country grouping

Issues	**ALL**	IN	ET	OD	LD	SI
Lack of financial, human and technical resources	●	●	●	●	●	●
Lack of public education and awareness at all levels.	●	●	●	●	●	
Lack of economic incentive measures	●		●	●	●	●
Loss of biodiversity, goods & services not properly understood, documented	●		●	●	●	●
Lack of knowledge & practice on ecosystem-based management	●		●	●		●
Inadequate capacity to act, caused by institutional	●			●	●	●

[38]Tomme Rosanne Young, 'The Challenge of a New Regime: The Quest for Certainty in "Access to Genetic Resource and Benefit-Sharing",' *Asian Biotechnology and Development Revie*w, 2008, Vol10(3), Page 122

[39] MS Suneetha and BalakrishnaPisupati, Benefit Sharing in ABS: Options and Elaborations, (Yokohama: United Nations University Institute of Advanced Studies, 2009) page 14

[40] Ibid page 19; Tomme Rosanne Young, 'The Challenge of a New Regime: The Quest for Certainty in "Access to Genetic Resource and Benefit-Sharing",' Asian Biotechnology and Development Review, 2008, Vol10(3), Page 122

[41] Michael R. W. Rands, William M. Adams, Leon Bennun, Stuart H. M. Butchart, Andrew Clements, David Coomes, Abigail Entwistle, Ian Hodge, Valerie Kapos, Jörn P. W. Scharlemann, William J. Sutherland and BhaskarVira, "Biodiversity Conservation: Challenges Beyond 2010", Science, 10 September 2010, Vol. 329(5997), page 1300

[42] Ibid.

[43] Ibid.

[44]Secretariat of the Convention on Biological Diversity (2010) Global Biodiversity Outlook 3. Montréal accessed at http://gbo3.cbd.int/

[45]Secretariat of the Convention on Biological Diversity (2010) Global Biodiversity Outlook 3. Montréal accessed at http://gbo3.cbd.int/ ; Ad Hoc Open-Ended Working Group On Review Of Implementation Of The Convention, Synthesis and analysis of obstacles to implementation of national biodiversity strategies and action plans: lessons learned from the review, effectiveness of policy instruments and strategic priorities for action, (Paris: 9-13 July 2007) accessed at http://www.cbd.int/doc/meetings/wgri/wgri-02/official/wgri-02-02-add1-en.pdf page 8-9

weaknesses							
Lack of effective partnerships	●		●			●	●
Lack of horizontal cooperation among stakeholders	●		●			●	
Unsustainable consumption and production patterns	●		●			●	
Lack of mainstreaming and integration of biodiversity issues	●		●				
Lack of benefit-sharing.				●		●	●
Lack of capacities for local communities.				●		●	●
Lack of precautionary and proactive measures, reactive policies.			●	●			
Lack of synergies at the national and international levels						●	●
Lack of political will and support to implement the CBD			●				
Limited public participation and stakeholder involvement			●				
Lack of transfer of technology and expertise						●	
Lack of adequate scientific research capacities						●	
Loss of traditional knowledge							●
Existing scientific and traditional knowledge not fully utilized.							●
Lack of appropriate policies and laws							●
Weak law enforcement capacity							●

Note: Column Headings: All = All reporting countries; IN = industrialized countries, ET+ countries with economies in transition; OD = other developing countries (i.e developing countries excluding LDCs and SIDS); LD = Least developed countries; SI = small island developing States.
Source: Ad Hoc Open-Ended Working Group On Review Of Implementation Of The Convention, Synthesis and analysis of obstacles to implementation of national biodiversity strategies and action plans: lessons learned from the review, effectiveness of policy instruments and strategic priorities for action, (Paris: 9-13 July 2007)

Alien Species

Invasive alien species is another driver of biodiversity loss. Although mentioned in passing in Chapter 15 of Agenda 21, greater effort is needed to address this issue. Invasive alien species out compete native species, altering ecosystems and causing significant economic damage. Estimates place the costs of dealing with the effects of invasive species at hundreds of billions of dollars annually. Introductions can occur accidently; the forest devouring Asian Long Horned Beetle arrived via shipping crates while the Zebra Mussel migrated using transoceanic ships' ballasts. They can also occur intentionally as in the case of beavers in Argentina to begin a fur industry but are now damming rivers. Or, the introduction of the Indian Mongoose to various parts of the world, which was introduced for pest control, but has caused the extinction of several native species and is threatening others. Strides are being made to address this issue through the introduction of Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of

Alien Species that Threaten Ecosystems, Habitats or Species in 2002, the International Convention for the Control and Management of Ships' Ballast Water and Sediments in 2004 and the analysis completed on gaps in the international regulatory framework. A point raised by the report is inadequate implementation at the national level and lack of national capacity. The Global Invasive Species Programme which assisted in building capacity in developing countries ceased operations in the Spring 2011 after 14 years due to lack of funding.

Protected areas

In recent years, forests and biodiversity have gained recognition as international development issues as evidenced through the United Nations declaration of 2011 as the International Year of Forests (to promote sustainable forest management, conservation and development of all types of forests); and 2011-2020 as the United Nations Decade of Biodiversity.[46] Over the past decades, more participators forms of forest management for effective and sustainable conservation have increased. Efforts to conserve biodiversity have shifted from law enforcements to more participatory approaches emphasizing equitable and sustainable use of natural resources.[47] This change is especially important in remote rural areas and poor developing and least developed countries where biodiversity is concentrated and poverty is widespread. Securing the conservation of biodiversity, while promoting sustainable development, is one of the greatest challenges of our time.[48] Since 1992, the global network of protected areas has continued to grow steadily, increasing yearly by an average 2.5% in total area and 1.4% in numbers of sites, and by 2006 covering more than 24 million km2 in about 133,000 designated sites. The key pressures driving biodiversity loss are overexploitation of species, invasive alien species, pollution, climate change, and especially the degradation, fragmentation, and destruction of habitats. Some important functions of protected areas include biodiversity, tourism, forest products, local amenities, soil conservation, carbon sequestration, research, cultural values, watershed protection, and storm protection.

In Asia and the Pacific, total forest cover is expanding while the proportion of primary forest, which are biodiversity rich, area is declining; this complex relationship is detailed in the 2010 Global Forest Resources Assessment of FAO6. The 2010 figures show that 34% of the world's forestland is primary as compared to 25% in Asia and the Pacific. Terrestrial areas protected include forests, swamps, plains and desert areas. After a rapid increase between 1990 and 2005, the share of terrestrial protected areas reached a plateau between 2005 and 2009. In terms of marine areas protected, the Asia and the Pacific experienced rapid growth between 1990 and 2009, with the protected surface area reaching 5.0% of the territorial water area in 2009 (up from 2.0% in 1990).

However, these numbers fall vastly short of the Strategic Plan objectives adopted in 2010 as an outcome of the tenth meeting at Nagoya, Japan, of the Conference of the Parties to the Convention on Biological Diversity. One of the primary aims of the Plan is to "improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity". To achieve this goal, an increase in the terrestrial areas protected to 17% and coastal and marine areas to 10% is targeted by 2020. Since the expansion of protected areas between 1990 and 2005, progress has since slowed considerably, and the road to reach the Nagoya objectives remains long.[49] The Asian and Pacific region accounts for nearly one third of all the threatened species in the World and in

[46] Biodiversity, protected areas and forests, Statistical yearbook for Asia and the Pacific 2011, available at: http://www.unescap.org/stat/data/syb2011/II-Environment/Biodiversity-protected-area-and-forests.pdf
[47] http://www.edinburgh.ceh.ac.uk/biota/Archive_scaling/6737.htm
[48] http://www.edinburgh.ceh.ac.uk/biota/Archive_scaling/6737.htm
[49] http://www.unescap.org/stat/data/syb2011/II-Environment/Biodiversity-protected-area-and-forests.pdf

the last two years (2008 to 2010), two thirds of countries in the region have experienced an increase in the number of threatened species.

According to the FAO's Global Forest Resource Assessment (FRA) report of 2010 the worlds forest area is just over 4 billion hectares; the five most forest rich countries (the Russian Federation, Brazil, Canada, the United States and China) account for more than half of the total forest area. Although the rate of deforestation shows signs of decreasing it is still alarmingly high. About 13 million hectares of forest were converted to other uses or lost through natural causes each year in the last decade compared with 16 million hectares per year in the 1990s[50]. Between 2000 and 2010, the area of planted forest increased by about 5 million hectares per year. The area of forest where conservation of biological diversity is designated as the primary function has increased by more than 95 million hectares since 1990, of which the largest part (46 percent) was designated between 2000 and 2005.

The area of forest within a protected area system has increased by 94 million hectares since 1990. Two-thirds of this increase has been since 2000. The primary function of these forests is the conservation of biological diversity, the protection of soil and water resources and the conservation of cultural heritage. The area of forest designated for protective functions increased by 59 million hectares between 1990 and 2010, primarily because of large-scale planting in China aimed at desertification control, conservation of soil and water resources and other protective purposes.

Significant progress has been made in developing forest policies, laws and national forest programmes. Of the 143 countries that have a forest policy statement, 76 countries have issued or updated their statements since 2000. Of the 156 countries that have a specific forest law, 69 countries – primarily in Europe and Africa – reported that their current forest law has been enacted or amended since 2005. At the global level there had been progress towards sustainable forest management, particularly in the last ten years, but many negative trends remain at regional, sub-regional and national levels.

Way Forward

The Secretariat of the Convention on Biological Diversity identifies five key drivers in the decline of biodiversity: unsustainable use of biological resources, pollution, habitat destruction, invasive species, and climate change.[51]These drivers are a result of the obstacles faced by governments in preserving biodiversity such as the lack of resources, lack of mainstreaming of biodiversity into decision-making, lack of scientific knowledge and public awareness.

The Funding Gap

To address the funding gap, the Nagoya Protocol includes a Strategy for Resource Implementation which establishes a financial framework with 15 indicators for monitoring its implementation and a promise to set targets at COP 11.[52]The CBD has established a Catalogue for Funding Sources and an Online Network on Finance to assist countries in locating funds and sharing best practices.[53]Addressing the funding gap on biodiversity will be crucial in the effort to meet global targets and ensure the involvement of developing countries.

[50] http://www.fao.org/docrep/013/i1757e/i1757e.pdf
[51]Secretariat of the Convention on Biological Diversity (2010) Global Biodiversity Outlook 3. Montréal accessed at http://gbo3.cbd.int/ page 9
[52] "Indicators and Targets," Convention on Biological Diversity website, accessed at http://www.cbd.int/financial/stragety/indicators/
[53] "Financial Resources and Mechanism," Convention on Biological Diversity website accessed at www.Cbd.int/financial

Internalizing Externalities

It has long been recognised in economics that environmental damage is an externality, i.e. its cost or benefit is not accounted for in business decisions and economic analysis.[54] Perverse incentives, i.e. policy or failures, have also compounded the problem. These include subsidies for fishing, agriculture, forestry and mining exploration which are used to encourage development and economic growth of the target sector. Efforts are now being made to counter this market failure by properly accounting for ecosystems services, for example through The Economics of Ecosystems and Biodiversity (TEEB) study. The study commissioned by the G8+5 estimates that loss of biodiversity is 3 trillion annually.[55]Other initiatives being explored include the development of positive incentive measures to encourage sustainable use of biological resources.[56]These could take the form of payment for ecosystem services, and market incentives such as eco-labelling, trading schemes, tax credits for investment and performance bonds. Research in these areas is continuing and a database on incentive measures and case studies has been created by the Convention on Biological Diversity and can be found on its website.[57]

Political Will

Ultimately, political will is needed to mainstream biodiversity considerations, address perverse subsidies and incorporate emerging strands of economic analysis in their pursuit of economic growth and development. Policy-makers and the public need better awareness of the value of biodiversity and services ecosystems can provide. The value of biodiversity must be made an integral element of social, economic, and political decision-making, as is starting to happen with carbon and climate change. The UN has designated 2011 to 2020 the decade of biodiversity in an effort to raise the profile of biodiversity. To address the knowledge deficit, a Intergovernmental Platform on Biodiversity and Ecosystem Services has been set up to bring scientists and policy makers together from around the world in an effort to incorporate biodiversity into policy decisions.[58] Other efforts have been made to improve scientific knowledge, for example the establishment of a Global Taxonomy Initiative, yet more needs to be done to better understand ecosystems in order to establish baselines and indicators of health and to bridge the research and knowledge divide between developed and developing countries.

Addressing Climate Change

Climate change is a significant driver of biodiversity loss. Rise in sea temperatures is bleaching coral reef ecosystems and destroying an important economic engine of many coastal regions and island states. The rise in sea temperature will also disrupt coastal fishing patterns as fish and marine mammals move to cooler waters which may no longer be within a countries jurisdictional boundaries leading to disputes over natural resources. The rise in surface temperatures will cause a shift in forest ecosystems as those plants and animals in the areas closes to the equator die off due to inability to cope with higher temperatures and changing weather patterns. Among other functions, forests play a crucial role in climate change mitigation and adaptation. One of the positive messages from FRA 2010 is that carbon emissions from forests have been reduced in recent years as a result of the decrease in the rate of deforestation combined with large-scale

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[5454] Michael R. W. Rands, William M. Adams, Leon Bennun, Stuart H. M. Butchart, Andrew Clements, David Coomes, Abigail Entwistle, Ian Hodge, Valerie Kapos, Jörn P. W. Scharlemann, William J. Sutherland and BhaskarVira, "Biodiversity Conservation: Challenges Beyond 2010", Science, 10 September 2010, Vol. 329(5997),page 1301

[55]PavanSukhdev, "Greening Economies, *Our Planet,* "accessed at http://www.unep.org/pdf/OP_sept/2010/EN/OP-2010-09-EN-ARTICLE5.pdf

[56]Secretariat of the Convention on Biological Diversity (2010) Global Biodiversity Outlook 3. Montréal accessed at http://gbo3.cbd.int/ page 12

[57] "Incentive Measures Database," Convention on Biological Diversity Website accessed at http://www.cbd.int/incentives/case-studies.shtml

[58] "About IPBES," IPBES website accessed at www.ipbes.net/about-ipbes.html

planting of new forests. It is expected that climate change will cause another global mass extinction comparable to the dinosaurs and megafauna dying out. More ambitious action to address climate change is therefore crucial at a global level through the UN Framework Convention on Climate Change (UNFCCC).

Re-visiting marginalised issues

Though there are a diverse range of complex issues that already present a significant burden to global policy-makers, it will be important to re-visit a number of important issues that have been marginalised in the debate. This includes greater engagement with the issue of invasive species, which presents a major obstacle to efforts to reduce biodiversity loss. Though Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitats or Species were introduced in 2002, so far studies suggest that there has been inadequate implementation at the national level and lack of national capacity.[59]The Global Invasive Species Programme which assisted in building capacity in developing countries ceased operations in Spring 2011 after 14 years due to lack of funding.[60]Clearly there is a significant gap in relation to action on invasive species at the global level that needs to be addressed.

Prognosis for biodiversity is grim with high levels of extinction expected to occur over the next hundred years.[61]The underlying drivers of biodiversity loss continue to increase and efforts have not had a significant impact. International negotiations and agreements have been acrimonious with a clear North-South divide that has hampered efforts. Political will and a new sense of cooperation between developed and developing countries is needed to meet the objectives originally outlined in Agenda 21 in 1992.

Mainstreaming biodiversity

In the last decade there has been an intense debate on the links between biodiversity conservation and poverty reduction.[62] Protected areas are often the dominant approach to protecting biodiversity and often times, it has been seen that the presence of widespread poverty and the need for agricultural development makes it difficult to preserve or conserve. The Convention on Biological Diversity (CBD) has always emphasised the need for integrating or 'mainstreaming' biodiversity into national and local development and poverty reduction strategies and has most recently stated so in its new Strategic Plan. The failure to meet the 2010 target to significantly reduce the rate of biodiversity loss demonstrates that conservation efforts have so far been insufficient.[63] In some cases the declining significance of biodiversity on the international agenda are correlated to the increasing emphasis on climate change rather than poverty reduction.[64] However, the links between biodiversity and climate change, and those between biodiversity and poverty reduction need not be separated. Links between biodiversity, poverty and climate change are clear: according to the IPCC, the effects of climate change will also include 20 to 30 per cent of plant and animal species being subjected to a greater risk of extinction if the rise in global temperature exceeds 2-3 °C.[65] As poor people are also more dependent on their land and

[59] Subsidiary Body On Scientific, Technical And Technological Advice, Report of the ad hoc technical expert group on gaps and inconsistencies in the international regulatory framework in relation to invasive alien species, (Auckland: 16-20 May 2005) accessed at http://www.cbd.int/doc/meetings/sbstta/sbstta-11/information/sbstta-11-inf-04-en.pdf page 3

[60] "Global Invasive Species Programme," Swedbio website accessed at http://www.swedbio.com/long%20GISP.htm

[61]Secretariat of the Convention on Biological Diversity (2010) Global Biodiversity Outlook 3. Montréal accessed at http://gbo3.cbd.int/ page 11

[62] "Whither biodiversity in development? The integration of biodiversity in international and national poverty reduction policy" http://pubs.iied.org/pdfs/G03005.pdf?

[63] " Look both ways: mainstreaming biodiversity and poverty reduction", IIED website, available at: http://pubs.iied.org/pdfs/17083IIED.pdf?

[64] Whither biodiversity in development? The integration of biodiversity in international and national poverty reduction policy" http://pubs.iied.org/pdfs/G03005.pdf?

[65] IPCC (2007) The Intergovernmental Panel on Climate Change Fourth Assessment Report. Summary for Policymakers. See

ecosystem for their livelihoods and more vulnerable to the effects of climate change; geographic location is one of the key factors in the vulnerability of poor nations and unfortunately the poorer countries of Asia and Africa will be disproportionately affected by climate change. It has been observed that the main routes of integrating or mainstreaming biodiversity into development policy at the international level have been through the development assistance agencies and at the national level through the Poverty Reduction Strategy Papers (PRSP). In a recent review of the PRSPs across Africa, Asia, Latin America and the Caribbean it was found that all but one makes reference to biodiversity. [66] However, the biodiversity has been going down the development assistance providing agencies agenda and one way of addressing both climate change and biodiversity is mainstreaming biodiversity into the development and climate change policies and programmes.

www.ipcc.ch/SPM2feb07.pdf.

[66] Roe, D. 2010. Whither biodiversity in development? The integration of biodiversity in international and national poverty reduction policy. *Biodiversity* **11**(1–2) 13–18.

Chapter 16: Environmentally Sound Management of Biotechnology

Introduction

Agenda 21 identified the emergence of modern biotechnology as a promising tool through which significant contributions to global sustainable development could be made, from better healthcare and improved food security to enhanced environmental protection and cleaner energy. It was also acknowledged that internationally agreed principles were needed to ensure the safe and environmentally sound management of biotechnology, as well as mechanisms to enhance international cooperation, specifically in regards to promoting the application of biotechnologies in developing countries. Chapter 16 contains the following programme areas:

- Increasing the availability of food, feed and renewable raw materials;
- Improving human health;
- Enhancing protection of the environment;
- Enhancing safety and developing international mechanisms for cooperation;
- Establishing enabling mechanisms for the development and the environmentally sound application of biotechnology.

Implementation

Increasing the availability of food, feed and renewable raw materials

The development and application of biotechnology has certainly had a significant impact across a range of global sectors over the past 20 years. Through the use of recombinant gene technology the production of genetically modified organisms (GMOs) including plants, animals and micro-organisms has been made possible. Within the agricultural sector genetically modified (GM) crops can improve productivity, yields and food quality.[1] Since the first GM crops were made commercially available in the mid-90s there has been an unprecedented increase in the area of land used for GM crops. From 1996 the global land area increased from 1.7 million hectares to 148 million hectares in 2010.[2] Considering only a handful of countries grow GM crops, most notably the USA, Brazil and Argentina which account for 70% of the global crop area, this is a staggering amount.[3] The most common GM crops grown globally are those with agro-chemical resistant traits such as herbicide-tolerant soybean (which accounts for half of the global GM crop land area[4]), insect-resistant Bt Cotton and insect and herbicide-resistant maize.[5] The use of these crops has been shown to reduce the use of traditional chemical insecticides and herbicides,[6] although there is substantial conflicting evidence in this area, with some studies showing that use of these chemicals has actually increased as a result of GM crop use.[7] There are also concerns about the long term-effects of GM crops and other genetically-modified organisms on the environment, such as the threat to biodiversity, as well as the potential effects on human health.[8]

[1] Modern food biotechnology, human health and development: an evidence-based study, WHO, 2005 http://www.who.int/foodsafety/publications/biotech/biotech_en.pdf
[2] Global Status of Commercialized Biotech Crops/GM Crops in 2010, ISAAA http://www.isaaa.org/resources/publications/pocketk/16/default.asp
[3] Ibid.
[4] Ibid.
[5] Modern food biotechnology, human health and development: an evidence-based study p.4, WHO, 2005 http://www.who.int/foodsafety/publications/biotech/biotech_en.pdf
[6] Brookes & Barfoot, 2011, GM crops: global socio-economic and environmental impacts 1996-2009
[7] Impacts of Genetically Engineered Crops on Pesticide Use: The First Thirteen Years http://civileats.com/wp-content/uploads/2009/11/13Years20091112.pdf
[8] The Uncertain Consequences of the Biotechnology Revolution In: International Governance of Biotechnology: Needs, Problems and

The regulation of GM crops varies considerably between countries, with governments often taking completely opposite views regarding their use. When GM crops first emerged the US took the decision to use existing regulatory frameworks for evaluating pesticides, food and feed and applying these in the risk analysis and management of new GM crops. The EU however decided to take a much more precautionary approach, analysing new crop varieties, and the processes by which they were developed, on a case-by-case basis. There remains considerable disagreement over whether GM crops should be regulated based on the properties of the final product, as is the case in the US, or on the process of developing the final product, as in the EU.[9] As a result of the EU's more precautionary approach, a number of strict regulations have been developed. The Regulation on genetically modified food and feed requires detailed safety assessments to be carried out at the EU level before GM food is allowed on the market, and strict authorisation and risk assessment processes have to be carried out by member states before GM crops can be grown. The Regulation also requires that all GM food is appropriately labelled so that consumers can make an informed choice. An additional regulation (Regulation 1830/2003) supplements this by also requiring all products consisting of or containing GMOs to be appropriately labelled, as well as being fully traceable.[10] The US and other pro-GMO countries, argue that these precautionary regulations are unnecessary, as the risks of GM foods are equal to those produced through conventional means. The stringent regulations mean that any GM products imported into the EU must also abide by the same rules regarding authorisation, labelling and traceability, which has greatly affected the ability of countries growing and selling GM products to trade with the EU.[11]

Improving human health

Modern biotechnology has enabled huge advances to be made in healthcare, with its application in drug development having arguably the most impact over the past two decades. Through the use of GMOs, most notably micro-organisms, the large-scale production of insulin, human growth hormone and other drugs has been made more efficient, sustainable and cheaper.[12] The pharmaceutical industry is now seeing a shift away from the conventional chemical manufacturing of small molecule drugs towards biotechnology manufacturing processes. By 2014 it is predicted that 50% of the top 100 drugs produced globally will be biotech products.[13] There is less political and social controversy surrounding the application of biotechnology in the pharmaceutical industry. This is mainly because pharmaceutical products, in comparison to agricultural products, are generally consumed in response to a particular ailment or need, and the consumer is therefore more interested in how effective the product is, as opposed to how it was developed, as is often the case with food products. Moreover, the regulatory processes that are in place which govern the use and marketing of pharmaceutical products are very robust, with new products requiring years of testing and clinical trials before they are allowed on to the market.[14]

Potential, Catherine Rhodes, 2010
http://www.bloomsburyacademic.com/view/InternationalGovernanceBiotechnology_9781849661812/chapter-ba-9781849661812-chapter-0000465.xml

[9] IRGC, 2009, Risk Governance of Genetically Modified Crops in Europe
http://www.irgc.org/IMG/pdf/GM_crops_full_case_study_web.pdf

[10] European Commission, Rules on GMOs in the EU – Introduction http://ec.europa.eu/food/food/biotechnology/gmo_intro_en.htm

[11] OECD, 2007, An Overview of Regulatory Tools and Frameworks for Modern Biotechnology: A Focus on Agro-Food
http://www.oecd.org/dataoecd/11/15/40926623.pdf

[12] Ibid p.10

[13] EvaluatePharma, 2009, Biotech set to dominate drug industry growth
http://www.evaluatepharma.com/Universal/View.aspx?type=Story&id=188700&sectionID=&isEPVantage=yes

[14] OECD, 2007, An Overview of Regulatory Tools and Frameworks for Modern Biotechnology: A Focus on Agro-Food, p.10
http://www.oecd.org/dataoecd/11/15/40926623.pdf

Other biotechnology applications are more controversial however, such as genetic testing, gene therapy (which can be used to treat genetic disorders), cloning and stem cell research which pose major ethical questions. The use of human genetic data is a highly sensitive topic, and we are already seeing the development of national genetic databases. It is vital that personal information is protected and basic human rights recognised in relation to the use of this data. Several global instruments have been developed in this area, which are mentioned below.[15]

Enhancing protection of the environment

Biotechnology can be used to prevent environmental degradation and help preserve natural resources through a wide range of applications. Biopolymers have been produced that can be substituted for traditional plastics, cutting fossil fuel use by 50%, and biological water treatment systems have been developed that greatly lower water and energy usage.[16] The use of GMOs in bioremediation, the removal of pollutants from an environment using micro-organisms, has huge potential, but the regulatory procedures present in many countries often limit the ability to apply the technology in the field.[17]

Enhancing safety, developing international mechanisms for cooperation and establishing enabling mechanisms

Due to the complexity of biotechnology, and the range of sectors that it can be applied in, there exists plenty of international and regional legislation, on different aspects of biotechnology, but very little broad legislation or agreements.

Article 19 of the Convention on Biological Diversity identifies the importance of promoting fair and equitable access to the benefits of biotechnologies, particularly in developing countries. The Convention also indentified the need for a protocol to establish procedures for the safe transfer and use of biotechnology products, specifically genetically modified organisms (GMOs) that may adversely affect biodiversity and conservation.[18] Consequently in 2000 the Cartagena Protocol on Biosafety was adopted, which entered into force in 2003. The Protocol assists parties with capacity building, monitoring, reporting and risk assessments in regard to the safe transfer of biotechnology products. It also provides a funding mechanism via the Global Environment Facility, as well as an information clearing house.[19]

The Joint FAO/WHO Food Standards Programme (Codex Alimentarius) provides principles for risk analysis of foods derived from modern biotechnology.[20] It supplies guidelines on how to conduct food safety assessments, communicate risks and improve capacity of regulatory bodies.[21]

The International Declaration on Human Genetic Data (IDHGD), 2003, Universal Declaration on Bioethics and Human Rights (UDBEHR), 2005, and United Nations Declaration on Human Cloning (UNDHC), 2005, address the ethical and social impacts of human genetic engineering and provide principles to ensure the protection of human rights.[22] The IDHGD aims to protect

[15] Ibid p.11
[16] The Application of Biotechnology to Industrial Sustainability, OECD, 2001 http://www.oecd.org/dataoecd/61/13/1947629.pdf
[17] OECD, 2007, An Overview of Regulatory Tools and Frameworks for Modern Biotechnology: A Focus on Agro-Food, p.20 http://www.oecd.org/dataoecd/11/15/40926623.pdf
[18] Convention on Biological Diversity, Article 19. Handling of Biotechnology and Distribution of its Benefits http://www.cbd.int/convention/articles/?a=cbd-19
[19] The Cartagena Protocol http://bch.cbd.int/protocol/
[20] Codex Alimentarius, WHO/FAO http://www.who.int/foodsafety/codex/en/
[21] WHO/FAO, 2009, Codex Alimentarius: Foods derived from modern biotechnology ftp://ftp.fao.org/docrep/fao/011/a1554e/a1554e00.pdf
[22] International Governance of Biotechnology: Needs, Problems and Potential, Catherine Rhodes, 2010 http://www.bloomsburyacademic.com/view/InternationalGovernanceBiotechnology_9781849661812/chapter-ba-9781849661812-chapter-0000465.xml

human rights in relation to the collection, processing, use and storage of human genetic data, proteomic data and the biological samples from which they are derived.[23] The UDBEHR, building on the IDHGD, is much broader in its scope, addressing all 'ethical issues related to medicine, life sciences and associated technologies as applied to human beings'. The UDBEHR provides a universal framework of principles to guide States when developing legislation in the field of bioethics.[24] The UNDHC calls for countries to prohibit all forms of human cloning and other forms of genetic engineering that may be 'contrary to human dignity'. The declaration was originally intended to be a legally-binding convention, but there was widespread disagreement among parties on the status of therapeutic cloning, which is used in stem cell research.[25]

Most recently The Nagoya Protocol was adopted in 2010 as a supplementary agreement to the Convention on Biological Diversity. It provides a transparent framework for the fair and equitable sharing of benefits arising out of the utilization of genetic resources. The Protocol provides a range of tools and mechanisms to help Parties comply with its obligations including awareness-raising, technology transfer and targeted financial support for capacity-building and development initiatives through the Global Environment Facility (GEF). It is yet to be seen whether the Nagoya Protocol will be effective, as it will only enter into force after being ratified by 50 countries – as of May 2011 it has been ratified by 24 countries.[26]

International collaboration and transfer of biotechnology is being addressed by a couple of global organisations. The International Centre for Genetic Engineering and Biotechnology (ICGEB), for instance, aims to assist developing countries in strengthening their scientific and technological capabilities in the field of genetic engineering and biotechnology. Since 2001, the ICGEB has implemented over 70 agreements and collaborations for training, transfer of technologies and patent licensing with industrial partners in various developing countries.[27] Likewise, in 2010, UNIDO (the United Nations Industrial Development Organisation) set up the International Industrial Biotechnology Network (IIBN), which aims to assist its members in accessing and developing biotechnologies for sustainable industrial development, and aims to catalyse South-South and North-South partnerships.[28]

Challenges and Conflicts

The biotechnology industry has become an economically important global industry, which has seen huge growth, yet the benefits for development, particularly in poorer countries as highlighted in agenda 21, have failed to be realized. Biotechnology is driven by commercial interests and has become an important profitable industry in the global economy. However, it is also an extremely expensive industry with estimates suggesting product development costs for industrial biotechnologies could amount to $20 million over a period of 2 to 5 years, and for biopharmaceuticals up to $300 million over a period of 7 to 14 years.[29] Due to these high development costs the industry is dominated by the private sector in developed countries. Only a

[23] UNESCO, International Declaration on Human Genetic Data http://portal.unesco.org/en/ev.php-URL_ID=17720&URL_DO=DO_TOPIC&URL_SECTION=201.html
[24] UNESCO, Universal Declaration on Bioethics and Human Rights http://portal.unesco.org/en/ev.php-URL_ID=31058&URL_DO=DO_TOPIC&URL_SECTION=201.html
[25] The Regulations In: International Governance of Biotechnology: Needs, Problems and Potential, Catherine Rhodes, 2010 http://www.bloomsburyacademic.com/view/InternationalGovernanceBiotechnology_9781849661812/chapter-ba-9781849661812-chapter-0000465.xml
[26] The Nagoya Protocol http://www.cbd.int/abs/
[27] ICGEB, Biotechnology transfer http://www.icgeb.org/biotechnology-transfer.html
[28] International Industrial Biotechnology Network http://indbiotech.net/
[29] Implementing Agenda 21 – A Report by the Secretary General (2002) http://www.earthsummit2002.org/es/preparations/global/Microsoft%20Word%20-%20SG%20report.pdf

handful of the more industrialised developing countries such as China and India have any significant biotechnology activity.

One of the main challenges associated with implementing some of the objectives of this chapter, is the lack of consensus around the risks, benefits and ethical consequences of biotechnology. For instance there is a huge amount of unsubstantiated evidence and conflicting information produced by various scientific, public and commercial bodies regarding GM foods and their potential effects on humans and the environment.[30] The sheer abundance of information available on GM food makes it very difficult to give an accurate and objective assessment of the situation. Furthermore, there has been serious criticism of GM food companies blocking scientists from conducting independent research on the potential environmental and health risks.[31] All this controversy has severely undermined public and political confidence of GM in many countries. The 2002 famine crisis in southern Africa highlights this. Food aid from the US was refused by several governments because it was GM, despite the fact that 13 million people were facing starvation.[32] This lack of consensus creates conflicts between different national and regional policy frameworks, as highlighted by the US and EU stance on GM food. The EU has only approved the cultivation of two types of GM crops, the latest in 2010,[33] whereas US farmers have widely adopted a variety of GM crops since their commercial introduction in 1996.[34] [35] These conflicts in turn make it difficult to implement effective international legislation.

There are approximately 37 different international regulations related to the various socio-economic, ethical and environmental aspects of biotechnology, from the International Treaty on Plant Genetic Resources for Food and Agriculture, to the United Nations Declaration on Human Cloning. These regulations were developed separately from each other and largely designed for different purposes and based on different principles. Consequently, there is a lack of coherence between regulations, particularly in relation to the management of applications and impacts of biotechnology. This creates major difficulties in achieving coordinated global action, as it promotes conflicting regional and national policies and further divides public views and opinions of biotechnology around the world.[36]

As well as conflicting opinions and regulations between countries, the challenge of transferring biotechnology benefits to developing countries remains a key issue. Research and development in biotechnology is primarily concentrated in rich, developed countries. Unfortunately this means that there is often a bias towards the needs and interests of these countries rather than the world as a whole. In addition, due to the dominance of private sector companies working in biotechnology, and the inevitable safe guarding of intellectual property and trade agreements, rather than contributing to global development, biotechnology may in fact exacerbate the gaps already present between the North and South[37].

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[30] Modern food biotechnology, human health and development: an evidence-based study, WHO, 2005 http://www.who.int/foodsafety/publications/biotech/biotech_en.pdf

[31] Stutz, B. (2010) Companies Put Restrictions On Research into GM Crops, Yale http://e360.yale.edu/content/feature.msp?id=2273

[32] Modern food biotechnology, human health and development: an evidence-based study, WHO, 2005 http://www.who.int/foodsafety/publications/biotech/biotech_en.pdf

[33] Swinnen, J.F.M., & Vandemoortele, T. (2010). Policy gridlock or future change? The political economy dynamics of EU biotechnology regulation. *AgBioForum*, *13*(4), 291-296

[34] US Dept. Of Agriculture, Data Sets: Adoption of Genetically Engineered Crops in the U.S. http://www.ers.usda.gov/Data/BiotechCrops/

[35] European Commission, 2002, Communication From The Commission To The Council, The European Parliament, The Economic And Social Committee And The Committee Of The Regions: Life sciences and biotechnology – A Strategy for Europe http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2002:0027:FIN:EN:PDF

[36] International Governance of Biotechnology: Needs, Problems and Potential, Catherine Rhodes, 2010 http://www.bloomsburyacademic.com/view/InternationalGovernanceBiotechnology_9781849661812/chapter-ba-9781849661812-chapter-0000465.xml

[37] Ibid.

Private sector dominance means that developing countries have to rely on intergovernmental organisations for assistance in technology and knowledge transfer, such as the ICGEB and IIBN. However these public bodies tend to have only a minimal impact on sustainable development in the South, due to limited funds and unequal relations between industrial and developing partners when it comes to collaborative activities.[38]

Way Forward

It is widely acknowledged that we are only at the very start of a biotechnology revolution, and that we could soon see the emergence of the *bioeconomy*, in which a significant proportion of economic output is dependent on the development and application of biological materials and technology.[39] The potential applications of modern biotechnology are seemingly endless and it can, and should, play a key role in addressing some of the world's most pressing issues and aiding in the pursuit of a sustainable planet. For this to happen however, requires significant changes to the management and regulation of biotechnology at a global level.

A significant issue that must be addressed is biotechnology transfer and the need for greater public financial support. The low public investment observed in agricultural biotechnology and slow progress in regulating the potential risks associated with it has restrained the development and use of genetically modified organisms (GMOs) that could be used to address many of the food security problems found in developing countries. The potential benefits of these new biotechnologies may be missed unless greater support is given to those countries that are interested in utilising them.[40] The formation of new public-private partnerships may help stimulate greater financial input and support research and development collaboration with developing countries.

Further research and development is crucial to solving some of the uncertainties surrounding the application of biotechnology and its potential impacts and risks. When new, relevant information becomes available it is important that this is widely disseminated. An active and sustained dialogue with society and industry on the socio-economic and ethical implications, benefits, and requirements of biotechnologies is needed to ensure that everyone is involved and understands the current issues.[41] There must be greater transparency within industry and government around these issues. When it comes to GMOs for example, open information disclosure, labelling, and consultative processes are crucial for harnessing public support.[42] Greater public support leads to more unified legislation and regulatory processes.

In terms of international governance of biotechnology one possible solution to some of the challenges described above would be to establish an overarching framework of principles on biotechnology management. This framework could guide the development and implementation of the many existing regulations related to biotechnology; it could help raise awareness of how they overlap and improve their coherence. The international community would need to decide which principles to use as the basis of biotechnology governance and then revise or supplement the current regulations as required.[43]

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[38] UNDESA, 2001, Transfer of environmentally sound technologies, cooperation and capacity-building http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N01/274/75/PDF/N0127475.pdf?OpenElement
[39] The Bioeconomy to 2030, OECD http://www.oecd.org/dataoecd/5/24/42837897.pdf
[40] World Bank, 2008, World Development Report http://siteresources.worldbank.org/INTWDR2008/Resources/WDR_00_book.pdf
[41] The Bioeconomy to 2030, OECD, 2009 http://www.oecd.org/dataoecd/5/24/42837897.pdf
[42] World Bank, 2008, World Development Report http://siteresources.worldbank.org/INTWDR2008/Resources/WDR_00_book.pdf
[43] International Governance of Biotechnology: Needs, Problems and Potential, Catherine Rhodes, 2010 http://www.bloomsburyacademic.com/view/InternationalGovernanceBiotechnology_9781849661812/chapter-ba-9781849661812-chapter-0000465.xml

Chapter 17: Protection of the Oceans, All Kinds of Seas, Including Enclosed and Semi-Enclosed Seas, and Coastal Areas and the Protection, Rational Use and Development of Their Living Resources

Introduction

Oceans and coastal areas were a serious concern at the Rio Summit. Half of the world's population lived along the coast line and marine habitats were suffering from land based pollution. Overfishing both on the high seas and within national jurisdiction was a problem and small developing island states needed assistance to develop sustainably. In light of these issues Chapter 17 addressed seven programme areas: integrated management and sustainable development of coastal areas, including exclusive economic zones; marine environmental protection; sustainable use and conservation of marine living resources of the high seas; sustainable use and conservation of marine living resources under national jurisdiction; addressing critical uncertainties for the management of the marine environment and climate change; strengthening international, including regional, cooperation and coordination; and sustainable development of small islands.

Implementation

Integrated Management and Sustainable development of coastal and Marine Areas

The Rio convention called for integrated coastal zone management (ICZM) and ecosystem based approaches to replace sectoral approaches[1]. Significant progress has been made, however, many states are struggling with implementation needs to be expanded to areas beyond national jurisdiction[2]. Although progress has been made regionally on implementing a high-level policy framework for ICZM, often at the national or local scale there is a low specificity of and incompatibility of environmental, social and economic objectives. There is little agreed guidance on the priority to be given to objectives when trade-offs have to be made, often incumbent decision-making systems that are strongly influenced by short-term national interests, and low societal and political will to pay the high short-term costs of making the transition to sustainability. Although progress is slow at present, there is progress regionally as awareness for the need to regulate anthropogenic activities, reduce marine pollutants and conserve natural capital gains more and more momentum. Many regions are recognising the need for action, developing Marine Spatial Planning (MSP) tools on a national scale and coordinating transboundary efforts.

[1] Report of the Secretary General, Implementing Agenda 21, (United Nations Economic and Social Council, December 2001) accessed at http://www.johannesburgsummit.org/html/documents/no170793sgreport.pdf Page 27

[2] Report of the Secretary General, Implementing Agenda 21, (United Nations Economic and Social Council, December 2001) accessed at http://www.johannesburgsummit.org/html/documents/no170793sgreport.pdf Page 148 geo outlook; Report of UN Secretary General, Oceans and the law of the sea, (United Nations General Assembly, 2010) accessed at http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N10/500/37/PDF/N1050037.pdf?OpenElement page 56

Marine Environmental Protection

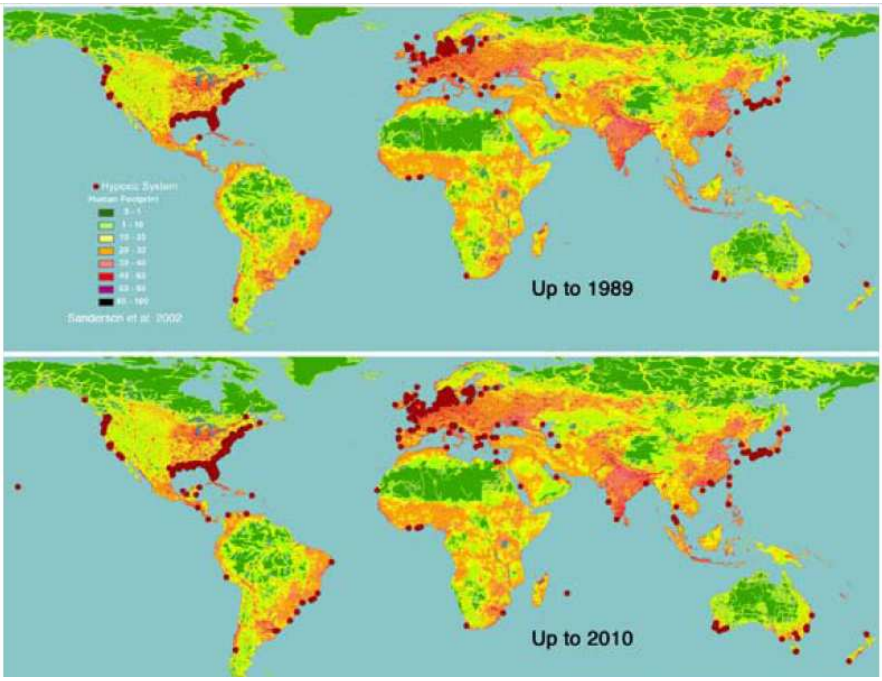

Figure 2 Extent of Hypoxia in Coastal Areas (Data from Southern Hemisphere is limited)

In the 20 years since Rio, the state of world's oceans and coastal areas has continued to decline despite the many international agreements and working groups that have been established[3] to promote ocean protection. Coastal areas are being heavily degraded with about 400 now intermittently or always oxygen depleted, including over 200 dead zones[4]. (See Figure 1) 80 per cent of the pollution impacting coastal areas is land-based, from agricultural and urban sewage runoffs[5]. With half of the world's cities within 50 kilometres of the coast and urban populations rising, coastal areas are predicted to deteriorate further[6]. Continental shelves and Deep sea habitats are being adversely affected due to fishing, in particular trawling, and other human activity[7]. A number of international agreements have been established to address sea based and land based pollution. The Global Programme of Action (GPA) for the Protection of the Marine Environment from Land based activities has been signed by 108 states and progress has been

[3] Report of UN Secretary General, Oceans and the law of the sea, (United Nations General Assembly, 2010) accessed at http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N10/500/37/PDF/N1050037.pdf?OpenElement Page 47

[4] Report of UN Secretary General, Oceans and the law of the sea, (United Nations General Assembly, 2010) accessed at http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N10/500/37/PDF/N1050037.pdf?OpenElement page 54; Christian Nellemann, Stefan Hain, and Jackie Alder (Eds), In Dead Water – Merging of climate change with pollution, over-harvest, and infestations in the world's fishing grounds, (Norway, United Nations Environment Programme/GRID-Arendal, 2008) accessed at http://www.unep.org/pdf/InDeadWater_LR.pdf page 9

[5] Report of UN Secretary General, Oceans and the law of the sea, (United Nations General Assembly, 2010) accessed at http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N10/500/37/PDF/N1050037.pdf?OpenElement page 59; Christian Nellemann, Stefan Hain, and Jackie Alder (Eds), In Dead Water – Merging of climate change with pollution, over-harvest, and infestations in the world's fishing grounds, (Norway, United Nations Environment Programme/GRID-Arendal, 2008) accessed at http://www.unep.org/pdf/InDeadWater_LR.pdf page 10

[6] Report of UN Secretary General, Oceans and the law of the sea, (United Nations General Assembly, 2010) accessed at http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N10/500/37/PDF/N1050037.pdf?OpenElement Page 54

[7] United Nations Environmental Programme, Deep-Sea Biodiversity and Ecosystems: A scoping report on their socio-economy, management and governance. (Nairobi: United Nations Environmental Programme, 2007) accessed at http://www.unep.org/regionalseas/publications/reports/RSRS/pdfs/rsrs184.pdf. Page 9

made in the development of regional and national plans of action[8] Working alongside the GPA is the UN Regional Seas Conventions and Action Plans which covers 18 regions. International Maritime Organisation has two conventions: International Convention for the Prevention of Pollution from Ships with over 120 signatories and the convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters (London Convention) with only 86 signatories. The latter convention was updated in 1996 to eliminate dumping except for 8 items on a reserve list; only 32 states have signed up to the agreement.

Sustainable Use and Conservation of Marine Living Resources of the High Seas

High seas fisheries have been successfully exploited for centuries, however the inaccessibility and significant operating risks has meant that anthropogenic activities have been limited to mostly sustainable levels. Fisheries in the high seas have the potential to be among the most sustainable and least environmentally damaging. Shoaling species (e.g. Atlantic Mackerel or North Sea Herring) collect into single-species aggregations and by-catch is minimal. In fact, recent data has suggested that some pelagic species are bucking the global trend of stock decline and are thriving under good management and regulation[9]. However not all scenarios are positive, tropical pelagic species such as tuna and jacks have been severely impacted by intensive long-lining with recent data indicating that 90 per cent of large pelagic fish species have been removed[10]. Destructive and unsustainable fishing methods such as long-lining and drift gillnets, despite international commitments to reduce their usage, continue as common practice and are responsible for significantly high global by-catch of small cetaceans[11] (especially common dolphins, dusky dolphins, common bottlenose dolphinsand Burmeister's porpoises), seabirds of which albatrosses are particularly vulnerable to long-lining and turtles.

The FAO has written guidelines on the management of demersal, bottom and deep sea fisheries in the high seas which are a voluntary instrument. A 2006 survey revealed a chasm of information gaps and data that renders management efforts, whether by flag states, bilaterally, regionally or globally unfit-for-purpose.

Sustainable Use and Conservation of Marine Living Resources under National Jurisdiction

Significant efforts have been made to address overfishing and exploitation of marine resources. The 1992 UN Convention on the Law of the Sea has 160 signatories, however, provisions relating to fishing are interpreted in a restricted manner[12]. The agreement for the Implementation of the Provisions of UNCLOS relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks has 77 signatories. The 1993 FAO Code of Conduct for Responsible Fisheries and Agreement to Promote Compliance with International Conservation and Management measures by Fishing Vessels on the High Seas has just 38 signatories including only 2 of the top 5 fishing nations. The 1973 Convention on Trade in Endangered Species (CITES), 1992 Convention on Biological Diversity (CBD), 1995 Jakarta Mandate of Marine and Coastal Biological Diversity, 1995 Rome Consensus on World Fisheries and the 1995 Kyoto Declaration and Plan of Action on the Sustainable Contribution of Fisheries to Food Security are other initiatives to address overfishing and biodiversity. These instruments overlap and duplicate

[8] Report of the UN Secretary-General, Overview of progress towards sustainable development: a review of the implementation of Agenda 21, the Programme for the Further Implementation of Agenda 21 and the Johannesburg Plan of Implementation, (United Nations Economic and Social Council, 24 February 2004) accessed at http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N04/240/38/PDF/N0424038.pdf?OpenElement page 11

[9] Kaiser *et al.* (2005) *Marine ecology, processes, systems and impacts*. Oxford University Press. Oxford.

[10] Worm *et al.* (2002) Consumer versus resource control of species diversity and ecosystem functioning. *Nature.* 417: 848-51

[11] Mangal *et al.* (2008) Small Cetacean captures in Peruvian artisanal fisheries: high despite international legislation. Biological Conservation. 143: 136-43

[12] Foundation for International Environmental Law and Development, Marine and Coastal Biodiversity in the Convention on Biological Diversity, (Field, 2010) accessed at http://www.field.org.uk/files/Field_MarineCoastalBio_WEB_0.pdf Page 3

efforts and are difficult to implement due to lack of resources and political will. Regional Fisheries Management Organisations have been set up to assist implementation, but, they need to be strengthened, particularly those in developing countries[13].

Despite the efforts at global and regional levels, fifty percent of global fish stocks are fully exploited including most of the top ten stocks which alone account for 30 per cent of all fish captured[14]. The last 38 years have seen the number of overexploited, depleted or recovering fish stocks increase to 32 per cent from 10 per cent leaving only 15 per cent underexploited[15]. (See Figure 2)

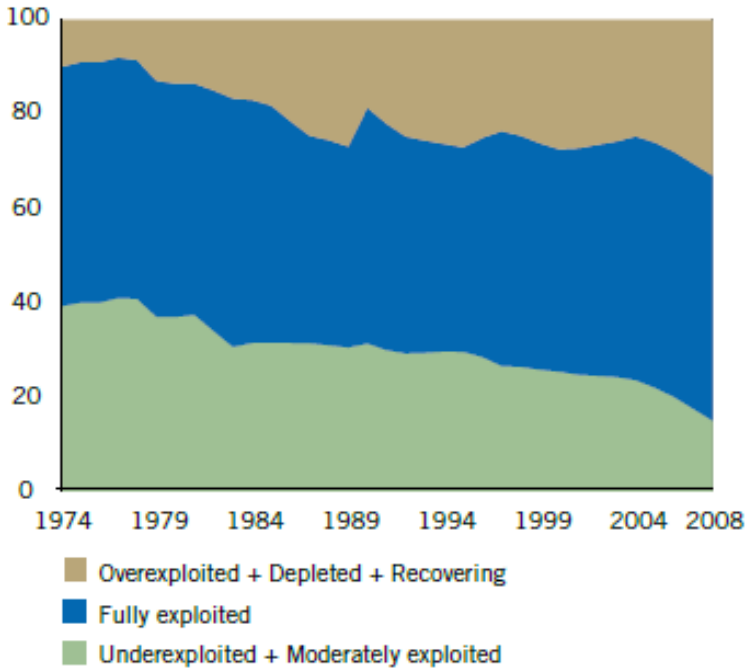

Figure 2. Status of Marine Fish Stocks
Source: Millennium Development Report, 2011.

The number of tonnes of marine catch has not changed in the last 20 years. However, there is variability in stock sizes, landings of cod, haddock and tuna have declined in the North Atlantic and Western Indian Ocean while landings of cephalopods (octopuses, squid) and crabs have increased in the Northwest and Eastern Central Pacific. Fish Stocks in the Northwest Atlantic are overexploited with 35 per cent depleted, however good fishing management has allowed several stocks to recover such as the Greenland halibut, yellowtail flounder and haddock. Despite a complete fishing ban in specific areas such as the Grand Banks, the Atlantic cod has not recovered since being depleted nearly 20 years ago. Recovery of stocks can take decades and dependent on other factors such as ecosystem health, larval recruitment and stock fecundity. Fisheries management in the South and Central Pacific has improved with national efforts and

[13] Food and Agriculture Organization of the United National, The state of world fisheries and aquaculture 2010, (Rome: FAO, 2010) accessed at http://www.fao.org/docrep/013/i1820e/i1820e.pdf Page 11; Food and Agriculture Organization of the United National, The state of world fisheries and aquaculture 2010, (Rome: FAO, 2010) accessed at http://www.fao.org/docrep/013/i1820e/i1820e.pdf page 148 and 163.
[14] Food and Agriculture Organization of the United National, The state of world fisheries and aquaculture 2010, (Rome: FAO, 2010) accessed at http://www.fao.org/docrep/013/i1820e/i1820e.pdf Page 8
[15] Ibid.

regional cooperation including the signing of the Convention on the Conservation and Management of High Seas Fishery Resources of the South Pacific Ocean. Increased demand for fish is being met by aquaculture which in 2008 accounted for 46 per cent of all fish harvested[16], up from 43 per cent in 2006. Aquaculture is increasingly plugging the gap left by declining traditional capture fisheries, but comes with its own problems as well. Fish protein is often the major component of feed pellets, often depleting capture fisheries in order to produce aqua-cultured higher profit species. Escapees from aquaculture can breed with local wild species, potentially weakening the survival potential of wild stocks and can introduce pathogens and parasites. Areas around aquaculture facilities can become oxygen depleted and waste products can pollute inshore and enclosed waters.

Increasingly, fishing quotas are being used globally to manage exploited fish stocks and have resulted in both positive and negative aspects. Recent studies have shown that fisheries managed using this system halt the trend to over exploitation and collapse and some have seen an increase in stocks, however, not all stocks respond in this way and some stocks using quotas have continued to decline[17]. A perverse outcome of quotas is that they can increase by-catch by up to 80 per cent of the catch. Economically valuable species in multi species fisheries are landed first to maximise fishing effort and profit, then lower profit-margin species are landed on a cost-benefit basis. Of that 80 per cent discarded, the mortality rate can be as high as 100 per cent further exacerbating food security issues and sustainability of currently non-targeted stocks. Latest discard estimates were around 7 million tonnes per year or around 5 per cent of total world fishery production in 2009.

Another commonly used method is marine protected areas (also known as marine reserves) whereby human activities, particularly extractive activities such as fishing and aggregate mining, are limited or banned. Many studies have shown that fish stocks can recover in a marine protected area, by preserving habitats and food chain integrity resulting in greater species density and sizes than in fished areas. However, research is in its infancy and at present is limited to reef habitats and fish with small ranges[18]. It has been shown that harvesting for commercially valuable fish can intensify along the borders, thus, MPAs alone would not be beneficial as a fisheries management tool[19]. Fish stocks with large ranges such as cod would be unlikely to benefit as the required size of the MPA might not be practical to manage[20]. MPAs are often small and need to include local stakeholders and civil society in their management in order to be successful.

Addressing critical uncertainties for the management of the marine environment and climate change

Climate change is beginning to have a significant effect on oceans. Ocean temperatures are rising, causing communities of organisms such as fish, plants and marine mammals to move to cooler waters. Rising ocean temperatures lead to thermal expansion resulting in global sea level rise

[16] Food and Agriculture Organization of the United National, The state of world fisheries and aquaculture 2010, (Rome: FAO, 2010) accessed at http://www.fao.org/docrep/013/i1820e/i1820e.pdf Page 3

[17] Christopher Costello, Steven D. Gaines and John Lynham, "Can Catch Shares Prevent Fisheries Collapse? *Science* 19 September 2008: Vol. 321 no. 5896 pp. 1678-1681; Cindy Chu, "Thirty years later: the global growth of ITQs and their influence on stock status in marine fisheries", *Fish and Fisheries* Volume 10, Issue 2, pages 217–230, June 2009

[18] Fisheries Society of the British Isles, Marine protected areas in the North Sea. Briefing Paper 1, , (Liverpool: FSBI, 2001) accessed at http://www.fsbi.org.uk/assets/brief-marine-protect-norefs.pdf; Luis W. Botsford, Daniel R. Brumbaugh, Churchill Grimes, Julie B. Kellner, John Largier, Michael R. O'Farrell, Stephen Ralston, Elaine Soulanille and Vidar Wespestad, Connectivity, sustainability, and yield: bridging the gap between conventional fisheries management and marine protected areas", Reviews in Fish Biology and Fisheries, Volume 19(1), 69-95 accessed at http://www.springerlink.com/content/71tn246178m11g4n/

[19] Ibid page 1, 4 and 5; Michael J. Fogarty and Steven A. Murawski, Do Marine Protected Areas Really Work? Georges Bank experiment offers new insights on age-old questions about closing areas to fishing, Oceanus website accessed at http://www.whoi.edu/oceanus/viewArticle.do?id=3782

[20] Fisheries Society of the British Isles, Marine protected areas in the North Sea. Briefing Paper 1, (Liverpool: FSBI, 2001) accessed at http://www.fsbi.org.uk/assets/brief-marine-protect-norefs.pdf page 5 and 6

(discussed below in Section F). Average ocean temperature increases of 3-4^{0}C can bleach coral communities, photosynthesising bacteria are ejected from within coral tissues usually leading to endemic coral mortality and ultimately the destruction of vital, highly biologically diverse habitats.

Ocean acidification is also occurring as the surface of the ocean absorbs more carbon dioxide from the atmosphere, recent studies have estimated a worst case scenario that rising ocean temperatures and acidification could destroy the world's coral reefs within a generation, a more moderate projection is that 35 per cent will be lost by 2050. Acidification has a fundamental impact not only on coral communities but also plants and organisms that cannot adapt to the higher level of acidity. Phytoplankton and other shelled organisms are also important as they take up carbon from the ocean and produce a significant proportion of atmospheric O_2 and as they die they can become a vehicle for transferring Carbon to the deep ocean and therefore into a more permanent sink. It has been noted that the ability of oceans to absorb carbon dioxide is decreasing. Carbon dioxide that normally moves to the deeper oceans through decaying marine organisms has not kept up with increasing levels of carbon dioxide in the atmosphere. Oceans normally absorb 25 per cent of atmospheric carbon while land ecosystems absorb another 25 per cent. As the ocean surface becomes saturated with carbon, the amount of carbon dioxide it absorbs from the atmosphere decreases, leaving more carbon dioxide in the atmosphere.

Sustainable Development of Small Islands

Small Developing Island States (SIDS) have made some progress toward sustainable development: coastal management plans have been implemented in some states, protected areas have been created, a number of cooperative initiatives have been established and two international strategies have been agreed to[21]. Despite these efforts, SIDS are still suffering from loss of biodiversity, habitat loss, coastal degradation, sea level rise and extreme weather events[22]. Implementation of the Barbados Programme of Action and the Mauritius Strategy has been slow[23].

Climate change will impact most severely on small islands states, global sea levels have risen by around 1mm per year since the industrial revolution[24]. Warmer ocean surface temperatures lead to thermal expansion and melting polar regions, glaciers and pack ice contribute to rising sea levels which threaten to decrease land area significantly. Coupled with increasingly more extreme weather events which can destroy coastlines, coastal communities are increasingly being forced to move inland. Small island communities rely on coral reefs and fishing for their survival. As sea temperatures rise, organisms will move to cooler areas that maybe outside the small island economic exclusive zone. Rising sea temperatures can lead to bleached coral reefs further reducing the availability of marine resources and breaking down surrounding protective reefs. Extreme weather events can erode significant areas of land once protective reefs are removed.

[21] Division for Sustainable Development, Department of Economic and Social Affairs, Trends in sustainable development Small Island Developing States (SIDS), (New York: United Nations, 2010) accessed at http://www.un.org/esa/dsd/resources/res_pdfs/publications/trends/trends_sids/Trends_in_Sustainable_Development_SIDS.pdf Page 24; Report of UN Secretary General, Sustainable development: follow-up to and implementation of the Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States, (United Nations General Assembly, 2009) accessed at http://www.unohrlls.org/UserFiles/File/SIDS%20documents/Reports/SG%20Report%20follow%20up%20to%20and%20implementation%20of%20MSI-10%20August%202009.pdf page 29

[22] Report of UN Secretary General, Sustainable development: follow-up to and implementation of the Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States, (United Nations General Assembly, 2009) accessed at http://www.unohrlls.org/UserFiles/File/SIDS%20documents/Reports/SG%20Report%20follow%20up%20to%20and%20implementation%20of%20MSI-10%20August%202009.pdf page 12

[23] Ibid. page 6

[24] World Meteorological Organization (2010) Climate, Carbon and Coral Reefs. Switzerland. WMO-No. 1063, accessed at: http://www.wmo.int/pages/prog/wcp/agm/publications/documents/Climate_Carbon_CoralReefs.pdf

Warmer temperatures can also have negative effects on mangrove communities which also provide a buffer between the sea and land and are also highly productive, biologically diverse habitats particularly important as nursery grounds for fish and invertebrate species.

Challenges and Conflicts

Lack of coordination

There has been a plethora of international initiatives to address the state of oceans, however progress has been slow and limited. A major challenge is the lack of coordination between many of the initiatives. For example, FAO has international guidelines for identifying vulnerable marine ecosystems in areas beyond national jurisdiction and the CBD also has a mechanism for identifying ecologically and biologically sensitive areas in both terrestrial and marine environments. Conflict arises in international meetings over which body is appropriate for addressing a particular issue. For example, a proposal was raised at a meeting of CITES to ban trade in Atlantic Bluefin Tuna, however, it was argued that the matter should be dealt with under the International Commission for the Conservation of Atlantic Tunas and the proposal was rejected[25]. Multiple and overlapping jurisdictions of different global agreements make it difficult to get clarity on where roles and responsibilities lie and allow for issues to be subject to political ping pong. This can lead to wasted time and resources and compromises marine protection objectives as it is not clear which institution has authority. Thus, there needs to be better coordination between various conventions and international initiatives in order for progress to be achieved and best use of limited resources[26]. The European Marine Strategy Framework Directive aspired to bring the incumbent a*d hoc* and piecemeal approach to the marine environment under one 'umbrella' in order to provide a framework and policy hierarchy for decision-making and allow for the creation of single national entities for authority. This type of approach would be useful at the intergovernmental level as well.

Lack of Capacity

Implementation requires financial, human and technological capabilities and resources and many countries, particularly developing states and SIDS need assistance[27]. Challenges to implementation of the Mauritius Strategy stem from decreases in overseas development aid, lack of technical expertise, and human resources[28]. Assessments of established marine protected areas have noted that many lack human capacity and funding[29]. Calls for a clearing-house mechanism for capacity building activities, transfer of marine technology, and more funding have been voiced recently at various international meetings[30]. Currently, the Intergovernmental

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[25] Food and Agriculture Organization of the United National, The state of world fisheries and aquaculture 2010, (Rome: FAO, 2010) accessed at http://www.fao.org/docrep/013/i1820e/i1820e.pdf page 8

[26] Foundation for International Environmental Law and Development, Marine and Coastal Biodiversity in the Convention on Biological Diversity, (Field, 2010) accessed at http://www.field.org.uk/files/Field_MarineCoastalBio_WEB_0.pdf page 2-3; David Freestone, Biliana Cicin-Sain, Indumathie Hewawasam, and Gwenaelle Hamon, Improving governance: Achieving integrated ecosystem-based ocean and coastal management, (paper prepared for the 5th Global Conference on Oceans, Coasts and Islands, May 3-10, 2010) page 1.

[27] Food and Agriculture Organization of the United National, The state of world fisheries and aquaculture 2010, (Rome: FAO, 2010) accessed at http://www.fao.org/docrep/013/i1820e/i1820e.pdf page 12.

[28] Report of UN Secretary General, Sustainable development: follow-up to and implementation of the Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States, (United Nations General Assembly, 2009) accessed at http://www.unohrlls.org/UserFiles/File/SIDS%20documents/Reports/SG%20Report%20follow%20up%20to%20and%20implementation%20of%20MSI-10%20August%202009.pdf page 6

[29] Toropova, C., Meliane, I., Laffoley, D., Matthews, E. and Spalding, M. (eds.) (2010). Global Ocean Protection: Present Status and Future Possibilities.(Gland:IUCN, 2010) accessed at http://data.iucn.org/dbtw-wpd/edocs/2010-053.pdf page 43

[30] Elisa Morgera, Summary of the third meeting of the working group on marine biodiversity in areas beyond national jurisdiction: 1-5 February 2010, Briefing Note on UNGA WG on Marine Biodiversity accessed at http://www.iisd.ca/oceans/marinebiodiv3/; Graeme Auld, Dan Birchall, Robynne Boyd, and Daniela Diz, Summary of the eleventh meeting of the open-ended informal consultative process on oceans and the law of the sea: 21-25 June 2010, Earth Negotiations Bulletin, Vol 25:65 accessed at http://www.iisd.ca/oceans/icp11/

Oceanographic Commission is working on capacity building as priority area with workshops, training in modelling and at sea training; and has established research institutes in all regions[31]. To further strengthen scientific capacity building and further involve developing countries in research, the Regular Process has recently been initiated[32]. Assistance is also provided through the Division for Ocean Affairs and the Law of the Sea and the UN Oceans programme. In addition, the UNCLOS's capacity building and technology transfer mechanism needs to be implemented and consideration given to establishing provisions on the accompanying funding and assistance program[33]. The IOC which is responsible for implementing the clause on marine technology transfer of UNCLOS established, in 2003, the IOC Criteria & Guidelines on Transfer of Marine Technology to provide guidance to member states on the clause's implementation[34]. A mechanism for assistance, in regards to fisheries, is being discussed at the WTO Doha Development Round negotiations[35]. The Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks has an assistance fund however it suffers from lack of contributions[36]. Clearly efforts are being made to address the lack of capacity, but without high-level political buy-in and targeted resources progress will continue to be slow.

Fishing Subsidies

Debate continues on the role of fishing subsidies in promoting over-fishing. The World Bank has estimated that economic losses due to overfishing and fishery mismanagement in 2004 is "$51 billion with an 80 percent confidence level that the value is between $37 billion and $67 billion" and a "real cumulative global loss of wealth over the past three decades is estimated at $2.2 trillion"[37]. Fishing subsidies currently stand at an estimated $14-20 billion per year while the overall marine fish industry is worth only $US 90 billion annually[38]. Subsidies are directed toward operating costs of fishing fleets, modernization of fishing fleets, constructing processing plants and port facilities, marketing and foreign access rights[39]. As a result subsidies are leading to over capacity and overfishing when stocks are in decline. Developing countries feel these subsidies are beneficial and necessary to them in promoting and expanding their small fishing sector while developed countries are concerned about jobs and the economic state of coastal communities[40]. The Doha Declaration makes specific reference to fishing subsidies and negotiations are being held in the Negotiating Group on Rules. In 2005 at the Hong Kong Ministerial Conference it was agreed to eliminate subsidies that lead to overcapacity and overfishing. In April 2011 the chair released his report on fishing subsidies negotiations. He

[31] For more information visit IOC of UNESCO Capacity Development website accessed at http://www.ioc-cd.org/index.php?option=com_frontpage&Itemid=1

[32] Assessment of Assessments website accessed at http://www.unga-regular-process.org/index.php?option=com_frontpage&Itemid=1

[33] Elisa Morgera, Summary of the third meeting of the working group on marine biodiversity in areas beyond national jurisdiction: 1-5 February 2010, Briefing Note on UNGA WG on Marine Biodiversity accessed at http://www.iisd.ca/oceans/marinebiodiv3/ page 3; Ambassador Kriangsak Kittichaisaree of Thailand, Remaining gaps & challenges In capacity building & TMT to implement the oceans-related outcomes of the major summits on sustainable development (PowerPoint presentation at Twelfth Meeting of the UN Open-ended Informal Consultative Process on Oceans and the Law of the Sea 20-24 June 2011, accessed at http://www.un.org/Depts/los/consultative_process/ICP12_Presentations/Kittichaisaree_Presentation.pdf

[34] IOC Advisory Body Of Experts On The Law Of The Sea (IOC/ABE-LOS), IOC criteria and guidelines on the transfer of marine technology, (Paris: UENECO, 2005)

[35] Report of UN Secretary General, Oceans and the law of the sea, (United Nations General Assembly, 2010) accessed at http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N10/500/37/PDF/N1050037.pdf?OpenElement Page 42

[36] Daniela Diz, Alice Miller, Dorothy Wanja Nyingi, and Chris Spence, Summary of the resumed review conference of the UN Fish Stocks Agreement: 24-28 May 2010, Earth Negotiations Bulletin, Vol 7:65 accessed at http://www.iisd.ca/oceans/rfsaic/ Page 8

[37] World Bank and FAO, The sunken billions The economic justification for fisheries reform, (Washington: The International Bank for Reconstruction and Development / The World Bank, 2009) page 41.

[38] Introduction to fisheries subsidies in the WTO accessed at http://www.wto.org/english/tratop_e/rulesneg_e/fish_e/fish_intro_e.htm; Negotiating Group on Rules, Communication from the Chair, (Geneva: WTO, 21 April 2011) accessed at http://www.wto.org/english/tratop_e/dda_e/chair_texts11_e/chair_texts11_e.htm page 49

[39] Rashid Sumaila and Leslie Delagran, Subsidizing Fisheries, on the WTO website accessed at http://www.wto.org/english/res_e/publications_e/wtr10_22june10_e.htm

[40] Negotiating Group on Rules, Communication from the Chair, (Geneva: WTO, 21 April 2011) accessed at http://www.wto.org/english/tratop_e/dda_e/chair_texts11_e/chair_texts11_e.htm Page48

stated, ***"****At present there is too little convergence on even the technical issues, and indeed virtually none on the core substantive issues, for there to be anything to put into a bottom-up, convergence legal text, and there are no fisheries subsidies disciplines already in existence to which we could refer or revert. Nor would a text with either a small range of options, or with all positions and proposals presented as "options", be feasible.* ***"***[41]The areas of negotiation are currently looking at the prohibition of certain subsidies, general exceptions, special and differential treatment for developing countries, and fisheries management.

Unsustainable Fishing

Forty per cent of global catch is done unsustainably[42]. Most problematic is implementing ecosystem-based management, reducing illegal, unreported and unregistered fishing (IUU) and addressing by-catch, discards and destructive fishing. Destructive fishing practices such as bottom trawling need to be addressed as their use expands to previously unexploited and considerably more fragile deep sea ecosystems[43].

By-catch and Discard

By catch and discards are estimated to 7 million tonnes per year[44]. They include turtles, birds, sharks, marine mammals, commercially valuable fish that are not being specifically captured and juveniles of commercially valuable fish. The area most affected is the Northwest Pacific at 61 per cent and the Northeast Atlantic at 27 per cent of global rates[45]. Shrimp trawling and bottom dwelling fish such as haddock, cod, sole and halibut account for 50 per cent of discard. Tropical shrimp trawling of while accounting for 22 per cent of fish landings accounts for over 27 per cent of discards[46]. By catch and discards is associated with a high mortality rate and stocks of non target species are evident[47]. Progress has been made in both developed and developing countries on decreasing by-catch and discards[48]. Efforts are being made to address shrimp trawling and the FAO is in the process of developing guidelines.

Illegal, unregulated and unreported (IUU)

Illegal, unregulated and unreported (IUU) fishing is a serious threat with some estimates placing it at 30 per cent of global catch[49]. Introduction of traceability and certification is becoming increasingly widespread[50]. In 2009 an agreement was reached between 92 states on port state measures to prevent, deter, and eliminate IUU fishing from entering international markets. Only 15 states have signed the agreement. Attention is turning to managing resources in areas outside national jurisdiction.

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[41] Ibid. Page 46

[42] Tony Pitcher, Daniela Kalikoski, Ganapathiraju Pramod and Katherine Short, Not honouring the code. Countries are not complying with the UN Code of Conduct for Responsible Fisheries. It's time some changes were made, Nature, 5 February 2009, 658-659. Page 658

[43] United Nations Environmental Programme, Global environment outlook Environment for development GEO4, (Valletta: Progress Press Ltd 2007) accessed at http://www.unep.org/geo/GEO4/report/GEO-4_Report_Full_en.pdf page 163

[44] Food and Agriculture Organization of the United National, The state of world fisheries and aquaculture 2010, (Rome: FAO, 2010) accessed at http://www.fao.org/docrep/013/i1820e/i1820e.pdf page 12

[45] Kieran Kelleher, Discards in the world's marine fisheries An update, FAO FISHERIES TECHNICAL PAPER 470, (Rome: FAO, 2005) accessed at http://www.fao.org/docrep/008/y5936e/y5936e00.htm page xii

[46] Ibid.

[47] ibid

[48] ibid

[49] David Freestone, Biliana Cicin-Sain, Indumathie Hewawasam, and Gwenaelle Hamon, Improving governance: Achieving integrated ecosystem-based ocean and coastal management, (paper prepared for the 5th Global Conference on Oceans, Coasts and Islands, May 3-10, 2010) page 1

[50] Food and Agriculture Organization of the United National, The state of world fisheries and aquaculture 2010, (Rome: FAO, 2010) accessed at http://www.fao.org/docrep/013/i1820e/i1820e.pdf Page 12.

Aquaculture

Aquaculture accounted for around 46 per cent of total fish supply. Issues around sustainability have been raised due to amount of feed required (1kg of salmon requires around 10kg of fish meal to produce), use of antibiotics and degradation of coastal environments[51]. Aquaculture governance has been identified as a major challenge[52]. Voluntary guidelines on aquaculture certification were approved in early 2011.

Political Will

Political will to implement agreements is a fundamental requirement and one that is lacking[53]. An analysis of 53 developed and developing states (representing 96 per cent of catch) and their compliance with the voluntary FAO Code of Conduct for Responsible Fisheries found that compliance was poor even though states intended to implement the code[54]. The voluntary International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing Plans was agreed to in 2001 but only 10 states and one region have completed their plans and many have stalled[55]. Questions are being raised on whether voluntary instruments need to be binding[56]. Binding or not states need to be incentivised to become signatories to an agreement. For example, three of the top five fishing nations are not signatories to the 1993 Code of Conduct.

Information, Data and Evaluation

Information on ocean and coastal ecosystems continues to be limited and knowledge gaps are wide[57]. Difficulties exist in setting appropriate fishery quotas and assessing other human activities and assessing the effectiveness of various interventions such as marine protected areas[58]. A need to expand ecosystem based approaches to these areas has been recognized, a UN working group has been set up and development of global database on vulnerable marine ecosystems in high seas has begun[59]. More research is needed, better data collection and monitoring, and improved access to information. Little is known what effects climate change is having on ocean biochemistry,

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[51] Asheline Appleton, Tallash Kantai, Laura Russo, and Anna Schulz, Summary of the 29th session of the FAO Committee on Fisheries: 31 January – 4 February 2011, Earth Negotiations Bulletin, Vol 29:5 accessed at http://www.iisd.ca/FAO/cofi/cofi2011/ page

[52] Food and Agriculture Organization of the United National, The state of world fisheries and aquaculture 2010, (Rome: FAO, 2010) accessed at http://www.fao.org/docrep/013/i1820e/i1820e.pdf page

[53] Christian Nellemann, Stefan Hain, and Jackie Alder (Eds), In Dead Water – Merging of climate change with pollution, over-harvest, and infestations in the world's fishing grounds, (Norway, United Nations Environment Programme/GRID-Arendal, 2008) accessed at http://www.unep.org/pdf/InDeadWater_LR.pdf page ; Daniela Diz, Alice Miller, Dorothy Wanja Nyingi, and Chris Spence, Summary of the resumed review conference of the UN Fish Stocks Agreement: 24-28 May 2010, Earth Negotiations Bulletin, Vol 7:65 accessed at http://www.iisd.ca/oceans/rfsaic/ page

[54] Tony Pitcher, Daniela Kalikoski, Ganapathiraju Pramod and Katherine Short, Not honouring the code. Countries are not complying with the UN Code of Conduct for Responsible Fisheries. It's time some changes were made, Nature, 5 February 2009, page 659

[55] Food and Agriculture Organization of the United National, The state of world fisheries and aquaculture 2010, (Rome: FAO, 2010) accessed at http://www.fao.org/docrep/013/i1820e/i1820e.pdf Page 11

[56] Ibid.

[57] Elisa Morgera, Summary of the third meeting of the working group on marine biodiversity in areas beyond national jurisdiction: 1-5 February 2010, Briefing Note on UNGA WG on Marine Biodiversity accessed at http://www.iisd.ca/oceans/marinebiodiv3/ page ; United Nations Environmental Programme, Deep-Sea Biodiversity and Ecosystems: A scoping report on their socio-economy, management and governance. (Nairobi: United Nations Environmental Programme, 2007) accessed at http://www.unep.org/regionalseas/publications/reports/RSRS/pdfs/rsrs184.pdf. ; Report of UN Secretary General, Oceans and the law of the sea, (United Nations General Assembly, 2010) accessed at http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N10/500/37/PDF/N1050037.pdf?OpenElement page 55

[58] United Nations Environmental Programme, Global environment outlook Environment for development GEO4, (Valletta: Progress Press Ltd 2007) accessed at http://www.unep.org/geo/GEO4/report/GEO-4_Report_Full_en.pdf page ; Report of UN Secretary General, Oceans and the law of the sea, (United Nations General Assembly, 2010) accessed at http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N10/500/37/PDF/N1050037.pdf?OpenElement page 55

[59] Report of UN Secretary General, Oceans and the law of the sea, (United Nations General Assembly, 2010) accessed at http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N10/500/37/PDF/N1050037.pdf?OpenElement page 43; Elisa Morgera, Summary of the third meeting of the working group on marine biodiversity in areas beyond national jurisdiction: 1-5 February 2010, Briefing Note on UNGA WG on Marine Biodiversity accessed at http://www.iisd.ca/oceans/marinebiodiv3/ page; United Nations Environmental Programme, Global synthesis A report from the Regional Seas Conventions and Action Plans for the Marine Biodiversity Assessment and Outlook Series (Nairobi, United Nations Environmental Programme, 2010) accessed at http://www.marinebiodiversityseries.org/reports/UNEP%20Global%20Synthesis%20Marine%20Biodiversity%20Series.pdf page

ocean current patterns, and marine ecosystems. More research is needed and action taken to help communities adapt to these changes

Marine Debris

Prior to the MARPOL (73/78) and London (1972) conventions the primary source of marine litter was from dumping at sea, since these conventions the predominant source is from accidental spillages in shipping and materials leaked or blown from landfill sites. The input of marine debris, including derelict fishing gear, plastics and petroleum by products, into the oceans, causes injury and mortality of marine animals when they ingest or become entangled in debris. It is estimated that for every square mile of ocean there are around 46,000 pieces of litter, also estimated is that around 10 per cent of all plastic produced annually ends up in the ocean[60]. Due to ocean circulation and gyre patterns, marine litter often coagulates into amorphous masses. There is currently a 'plastic island' in the North Pacific that is estimated to be twice the size of Texas (around 1.4 million km^2) and up to 30m in depth. A significant aspect is the non-degradable nature of many plastics which rather than breaking down are ground into ever smaller pellets (nurdles) which resemble fish eggs increasing the chances of ingestion by marine animals. Subsequently those pellets are ground into ever smaller fragments; plastics have been identified at the nano-scale impacting on an ecotoxicological scale with marine crustaceans. A recent study of European beach sediments found that at least a third of the beaches and estuary sediments were made up of non-organic particles, specifically fragments of nylon and polyesters. At present, there is little information on the longevity of plastics in the marine environment and little knowledge on the long-term environmental impacts of plastic particles.

Box:1

In the early 1980s the jellyfish (*Mnemiopsis leidyi*) was introduced to the Black Sea through the discharge of ballast waters from international shipping. *Mnemiopsis* is a voracious predator, particularly of fish eggs and juveniles. *Mnemiopsis* quickly dominated the pelagic ecosystem. It is this introduction, coupled with poor fisheries management and marine pollution that are responsible for the collapse of the once thriving Black Sea Anchovy stocks.
Richardson *et al.* (2009)

Invasive Species

Introduction of invasive species transported globally in the ballast water of transoceanic ships is a major threat to marine biodiversity[61]. IMO has released guidelines addressing the discharge of ballast waters. Only 26 states, representing a quarter of merchant shipping, have ratified the International Convention for the Control and Management of Ships' Ballast Water and Sediments [62]. Efforts are also being taken to address gaps in the regulatory framework and address capacity building needs of developing states[63], but progress in this area remains a major challenge.

Way Forward

Although progress has been made in the last 50 years improving our understanding of the marine environment and the need for more sustainable use of marine resources, often our approach is reactive rather than proactive. There needs to be a global step-change in attitude towards the

[60] UNEP (2005). Marine Litter. An analytical overview. Accessed at: http://www.unep.org/regionalseas/Publications/Marine_Litter.pdf
[61] United Nations Environmental Programme, Global synthesis A report from the Regional Seas Conventions and Action Plans for the Marine Biodiversity Assessment and Outlook Series (Nairobi, United Nations Environmental Programme, 2010) accessed at http://www.marinebiodiversityseries.org/reports/UNEP%20Global%20Synthesis%20Marine%20Biodiversity%20Series.pdf page
[62] Report of UN Secretary General, Oceans and the law of the sea, (United Nations General Assembly, 2010) accessed at http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N10/500/37/PDF/N1050037.pdf?OpenElement
[63] ibid

oceans, a movement away from the concept that it is a limitless resource so infinite in capacity that man can have no impact. Momentum must be initiated to drive a global political will to protect and restore marine resources, integrated approaches to management and recognition of the invaluable ecosystem services that we derive from the oceans.

The Millennium Ecosystem Assessment found that over exploitation, including from by-catch, currently is the most widespread and direct driver of change and loss of global marine biodiversity, with habitat destruction, pollution, climate change impacts and spread of invasive species being additional major drivers[64]. Renewed efforts are needed to implement the objectives of Chapter 17 in light of current and emerging trends. In particular, action is needed in the following areas:

Addressing Fragmentation
The continued degradation of the marine environment is alarming. Ocean governance is fragmented and many of the instruments overlap. There is a need for better coordination between all the international and regional instruments[65]. It may be necessary to create a new body responsible for all aspects of marine conservation, regulation and enforcement coupled with a unification process for all marine conventions, conferences and legislation under one 'umbrella' to reduce uncertainty over authority and discourage political inertia.

Enhancing Knowledge
Knowledge of coastal and deep sea ecosystems needs to be expanded. The UN has recently established the Regular Process to assess the state of oceans and establish a global monitoring system. This process will rest on the ability to build capacity and technical expertise in marine assessment in various countries[66]. Momentum is needed for effective targeting of financial resources and technology transfers to assist developing states to comply with international agreements and a show of political will is vital from developed states and emerging economies.

Regulating Aquaculture
Governance of aquaculture is a challenge in many states[67]. While voluntary guidelines on aquaculture certification were approved in early 2011, efforts need to be intensified to produce an institutional framework on all aspects of aquaculture. Aquaculture has the potential to supply the majority of the world's fish protein requirements, however innovative and sustainable methods must be encouraged at all levels. Alternative aquaculture feeds must be sourced to avoid over-exploiting capture fisheries to feed cultured fisheries.

By-catch and IUU
By-catch and discard is a serious challenge and the incentives that drive those practices need urgently addressing. Guidelines are in the process of being developed by FAO, but, countries need to look at ways of decreasing by-catch through quotas, economic incentives or technologies particularly in multi species environments. Monitoring of the extent of by-catch and discard needs to be implemented to give an estimate of the extent of the problem and analyse which methods

[64] Brander, K. (2008) Tackling the old familiar problems of pollution, habitat alteration and overfishing will help with adapting to climate change. Marine Pollution Bulletin 56, 1957–1958.
[65] Food and Agriculture Organization of the United National, The state of world fisheries and aquaculture 2010, (Rome: FAO, 2010) accessed at http://www.fao.org/docrep/013/i1820e/i1820e.pdf
[66] UNEP and IOC-UNESCO 2009, An Assessment of Assessments, Findings of the Group of Experts. Start-up Phase of a Regular Process for Global Reporting and Assessment of the State of the Marine Environment including Socio-economic Aspects (Valletta: Progress Press Ltd, 2009) accessed at http://www.unep.org/regionalseas/globalmeetings/12/wp04-assessment-of-assessments.pdf Page 27
[67] Food and Agriculture Organization of the United National, The state of world fisheries and aquaculture 2010, (Rome: FAO, 2010) accessed at http://www.fao.org/docrep/013/i1820e/i1820e.pdf page 86

are most effective. A database of case studies should be created to allow for knowledge sharing among countries and efforts at capacity building should be considered.

To tackle IUU political will and resources are needed. Only 15 of the 92 countries who agreed to the FAO port state measures have signed the agreement. Furthermore, only 8 countries and the EU have developed national plans of action to combat IUU. Many developing countries lack the resources to combat IUU and many developed countries with the resources do not display the political will to combat it. Efforts need to be directed to building capacity to develop and implement effective policies while sharing experiences on successful fisheries management[68].

Climate Change and Blue Carbon

Coastal wetlands and mangrove communities play an important role in absorbing Carbon. Mangroves, salt marshes and sea grasses are estimated to absorb up to 5 times as much Carbon as terrestrial forests. The Ramsar convention (1971) has been the principal instrument for protecting wetlands, more recently efforts are under way to protect them at the UNFCCC in the same manner as terrestrial forests. A step change in thinking is needed in protecting these valuable resources, recognising their natural capital and the role these ecosystems have to play in combating climate change.

[68] Food and Agriculture Organization of the United National, The state of world fisheries and aquaculture 2010, (Rome: FAO, 2010) accessed at http://www.fao.org/docrep/013/i1820e/i1820e.pdf page 80, 82, and 83.

Chapter 18: Protection of the Quality and Supply of Freshwater Resources: Application of Integrated Approaches to the Development, Management and Use of Water Resources

Introduction

Freshwater resource issues can predominantly be attributed to a lack of management in their assessment, provision and exploitation. Water management approaches that focus on supply-security above all else continue to aggravate inefficient allocation, distribution and use of water resources and often result in water quality deterioration. Water issues cut across society and all economic sectors. Population growth, rapid and unplanned urbanisation and industrialisation, expansion of agriculture and tourism and climate change are serious challenges for the future which will require innovative and integrated approaches to management.[1] Agenda 21 recognised that freshwater resources are needed for all aspects of life; it recognised the interconnected nature of water across sectors and geopolitical boundaries and that to protect them effectively would need management strategies that were far-reaching and dynamic. Primarily the intention was to shift the common approach from the supply-oriented mindset to a more holistic catchment-conscious approach,[2] integrating all stakeholders, users, polluters and regulators to inform governance processes and develop compatible monitoring systems to inform those processes. Although there have been significant developments in integrated management, technologies, and water quality in some regions, the state of global freshwater resources is more precarious today than ever before.

Implementation

Integrated Water Resources Development and Management (IWRM)

The target aspired in Agenda 21 for IWRM was that by the year 2000 member states would have designed and initiated targeted national action programmes, and should have put in place appropriate institutional structures and legal instruments around water management. Countries must have established efficient water-use programmes to attain sustainable resource use patterns. Subsequently, by 2025, countries will have achieved sub-sectoral targets of all freshwater programme areas.

Box 1: IWRM definition

There remains a high degree of variability relating to the definition of IWRM and the how the concept is actually implemented operationally. The most quoted definition is that formulated at the Global Water Partnership in 2000:

a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.

This mirrors the basic pillars of sustainable development of aiming to balance environmental, societal and economic issues while devising and implementing policy.

Biswas, 2004

Many countries have tacitly met the deadlines for developing IWRM plans following the Johannesburg World Summit on Sustainable Development in 2005. Some have also embodied the

[1]Global Water Partnership (2009) A Handbook for Integrated Water Resources Management in Basins.Accessed at: http://www.gwptoolbox.org/images/stories/Docs/gwp_inbo%20handbook%20for%20iwrm%20in%20basins_eng.pdf

[2]Newson, M. (2009) *Land, Water and Development: sustainable and adaptive management of rivers*. 3rd Edition

tenets of the concept into their legal instruments, but the actual implementation of the various aspects of it to support the day-to-day water management in most countries is a long way off. A 2008 survey by UN Water[3] illustrated that in developed countries only around 22 per cent of them have fully implemented IWRM plans with another 37 per cent partially implemented. Developing countries reflect similar levels of implementation status with ranges between 21 to 38 per cent. The Americas have improved most from 7 to 43 per cent implemented. Africa has made progress in stakeholder participation and micro-credit programmes while Asia has advanced on institutional reform, but is still struggling to coordinate those institutions.

Water Resources Assessment

The international Glossary of Hydrology[4] defines water resources assessment as the:

> "*Determination of sources, extent, dependability and quality of water resources for their utilisation and control*"

Assessments project that by 2025, 1.8 billion people will be living with absolute water scarcity and over 65 per cent of the world population could be subject to water stress.[5] IWRM is fundamental to identifying and targeting efforts at the most water inefficient sectors. The 4th edition of World Water Assessment Programme's report on the state of global water resources is yet to be published, however indications show that more needs to be done to assess water resources nationally and regionally.

Protection of Water Resources, Water Quality and Aquatic Ecosystems

Anthropogenic activities are increasingly impinging upon aquatic ecosystems whether through abstracting unsustainable volumes of water, pollution of aquatic systems or 'engineering' of water resources (damming, canals, river channel straightening etc.) which can fundamentally change both upstream and downstream physico-chemical and geomorphologic characteristics; and subsequently the incumbent aquatic ecosystems.

Recent data from the United Nations Environment Programme Global Environmental Monitoring System (UNEP GEMS/Water) shows that global concentrations of nitrates and phosphates from agriculture are increasing, despite global efforts to limit the wide-scale use of fertilizers. Industrial processes account for around 20 per cent of total water usage and are a growing cause (see box 1) of degraded surface and groundwater quality from microbiological contaminants, hazardous chemicals, heavy metals, sedimentation, aqueous pharmaceuticals and physico-chemical pollutants (temperature, salinity or pH). Figure 1 illustrates that the worst polluters are predominantly developed countries in the Northern Hemisphere.

[3]UN Water (2008) Status report on IWRM and water efficiency plans for CSD16.
[4]UNESCO (2002) Implementing Agenda 21: report to the Secretary-General
[5]United Nations Environment Programme (UNEP). (2007). Global Environment Outlook: environment for development 4. United Nations Environment Programme, Nairobi, Kenya

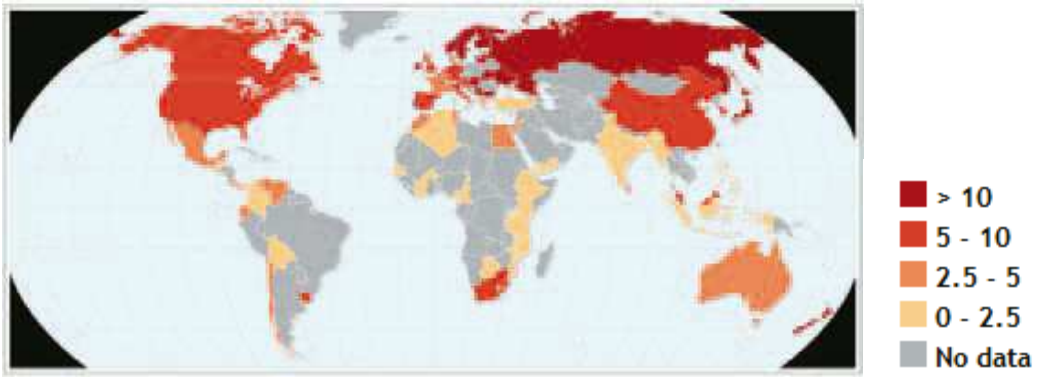

Figure 3: Discharge of industrial water pollution (in metric tons per million people per day
Source: UNEP, 2010.

Contamination of water resources with untreated human waste also continues to be of major concern; in developing countries, over 80 per cent of raw sewage is discharged untreated into water courses and even in more developed countries such as China, India and Iran this is still common practice.[6]

Drinking-Water Supply and Sanitation

Significant progress has been made in the provision of improved drinking water, with the greatest gains made in rural areas. This programme area is supported by the Millennium Development Goal (MDG) 7.C which aspires to:

"Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation"

This programme is on course to meet, if not exceed, the global target for access to improved drinking water, however there is much still to be done especially in SE Asia and Sub-Saharan Africa. Increasingly urbanised populations mean that safe drinking water provision becomes easier as per capita incomes are generally higher in urban areas and higher population densities economise water provision. However, in 2008 it was estimated that at least 1.1 billion people still lacked access to safe drinking water and about 2.7 billion were without adequate sanitation[7], with over 70 percent of those people living in Asia (~1.8 billion). Around 3 million people die annually of preventable water-related diseases, most of those children under five.[8] Figure 2 below illustrates global coverage of safe drinking water and sanitation.

The MDG sanitation target seems to be out of reach by 2015, but progress has been made, particularly in rural areas. In all areas progress was made primarily in rural areas. In the developing regions as a whole drinking water coverage in urban areas, which stood at 94 per cent in 2008, has remained almost unchanged since 1990. At the same time, rural drinking water coverage increased from 60 per cent in 1990 to 76 per cent in 2008.[9]

Extreme disparities still remain between urban and rural sanitation. Coverage with open defecation still prevalent, particularly in rural areas. Around 1.2 billion people (18 per cent of the global population) defecate in the open, the majority of those from the poorest communities

[6]Carr, G.M., Neary, J. P. (2008). Water Quality for Ecosystem and Human Health.*United Nations Environment Programme Global Environment Monitoring System*. 2nd Edition
[7] UNEP (2010) Clearing the waters: A focus on water quality solutions. Nairobi, ISO 14001:2004-certified. www.unep.org/PDF/Clearing_the_Waters.pdf
[8]United Nations Environment Programme (UNEP). (2007). Global Environment Outlook: environment for development 4. United Nations Environment Programme, Nairobi, Kenya
[9] MDG progress report, 2010.

although this practice is declining[10]. Predictably the detrimental effects of inadequate sanitation are still affecting the poor most and any improvements are largely still not being targeted at the most vulnerable in society.

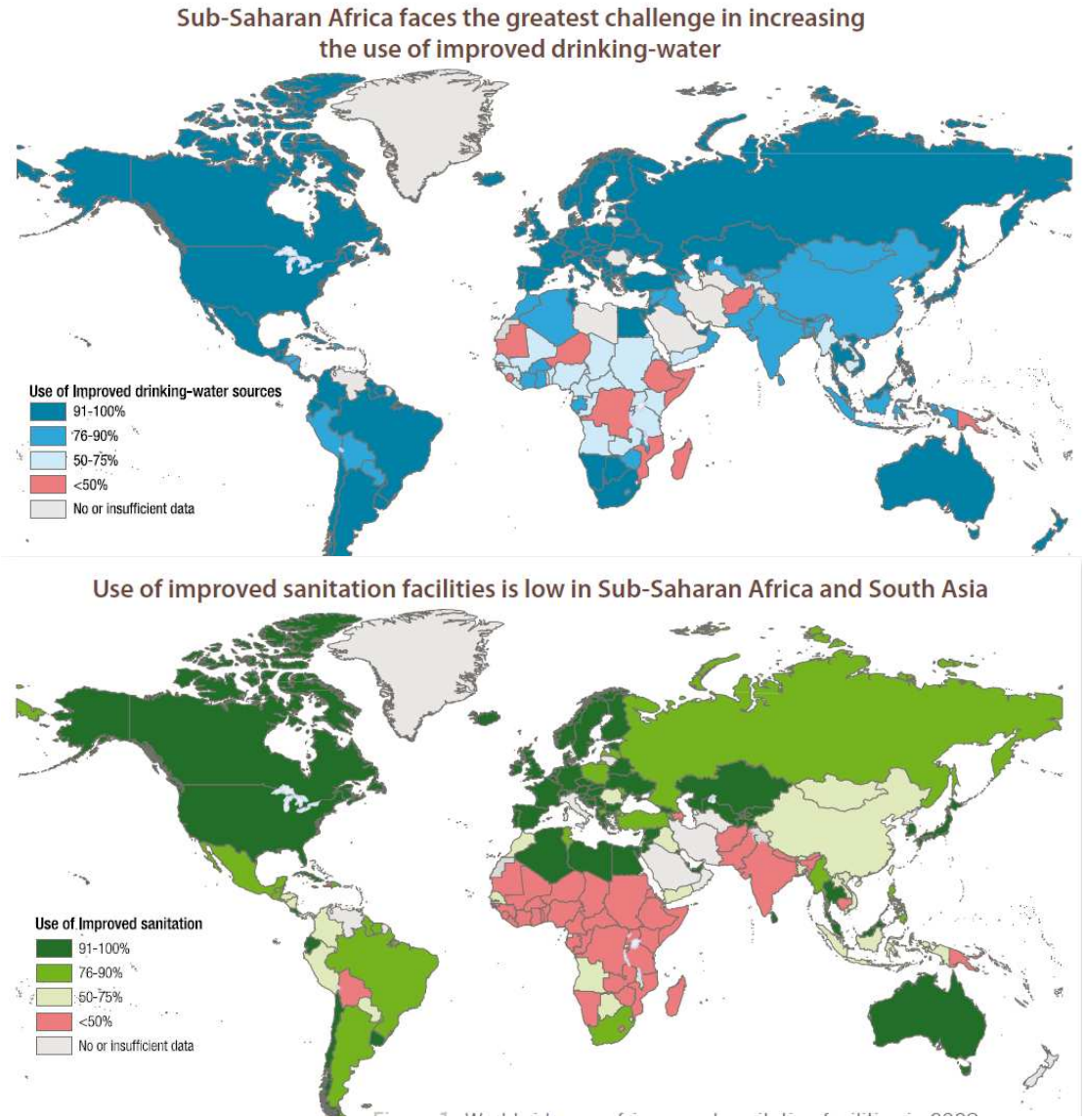

Figure 4: Global coverage of drinking water and sanitation
Source: WHO/UNICEF, 2010.

Water and Sustainable Urban Development

The UN estimates that by 2050 the world population will surpass 9 billion[11] which is almost half of the global population at the millennium added again. Since 2007, the majority of people now live in urban areas rising from 13% (220 million) in 1900, to 29% (732 million) in 1950, to 49% (3.2 billion) in 2005. By the year 2025, it is estimated that about 54 per cent of the population in developing countries will reside in urban areas. The task of providing safe water and adequate

[10]WHO/UNICEF (2010) Progress on Sanitation and Drinking Water: 2010 Update. Accessed at: http://www.wssinfo.org/fileadmin/user_upload/resources/1278061137-JMP_report_2010_en.pdf
[11] UNEP (2010) Clearing the waters: A focus on water quality solutions. Nairobi. Accessed at:www.unep.org/PDF/Clearing_the_Waters.pdf

sanitation services to the growing urban and peri-urban population continues to be a major challenge.[12]

Additional demand for water (for agriculture, industry and drinking water) reduces the available water for maintaining robust ecosystems, dilution of pollutants and groundwater recharge. During the 1990s, about 438 million people in developing countries gained access to improved drinking water supply. However, given the rapid growth of urban populations, the number of urban dwellers lacking access to safe drinking water supplies also increased in the 1990s, by nearly 62 million.

Box 4: Innovative wastewater technologies

Advances in technology are reducing the diseconomy of scale associated with small systems. Membrane bioreactors may make high-quality treatment available at low cost at much smaller scale than was previously available. And micro-filtration, reverse osmosis, electrodialysis, and advanced technologies make it possible to treat small, intermittent water flows that are not easily treated with biological processes like activated sludge or membrane bioreactors.

The application of phytotechnology approaches such as artificially constructed wetlands can be used for stormwater runoff and domestic sewage treatment. These approaches can buffer the effects of large amounts of rainfall while retaining, transforming, accumulating, and/or absorbing certain toxic compounds that originate on impervious surfaces. This type of approach has been successfully used in the Akanoi River purification system designed to help improve the water quality of Lake Biwa (Japan) by treating storm and agricultural runoff, as well as in the on-site urban wastewater wetland system in Huaxin, Shangai City in China.

UNEP, 2010

Urbanisation itself brings complex problems to water quality; impervious surfaces lead to increases in run-off of pollutants, changes to groundwater levels and untreated wastewater. The sustainability of urban development is hindered by inadequate wastewater management.This can lead to endemic waterborne and water-related morbidity and mortality in urban populations with the poorest people most vulnerable. Wastewater and sludge treatment sites are often already overburdened and are unable to cope with additional pressures. However advances in treatment technologies (see box 4) are starting to reduce the diseconomies of scale resulting in a range of cost-effective treatments at the municipal, community and household level[13].

Water for Sustainable Food Production and Rural Development

Areas of water scarcity are increasing, particularly in North Africa and West Asia. In the next two decades, it is estimated that 17 per cent more water will be needed to grow food for expanding populations in developing countries. Increasingly we are seeing global conflicts between resource allocation to agriculture and supply for urbanising populations.

The expansion of irrigated agriculture and growing demands for water for industrial and municipal uses had increased pressures on freshwater resources in most countries. Approximately 72 per cent of the world's exploited freshwater resources are used for irrigation[14]. Despite progress made in increasing the efficiency in irrigation systems, only 30 per cent of water supplied is actually used by crops and similar levels are associated with intensive livestock operations. More efficient technologies are being adopted in some countries, but much more progress is needed and swiftly.

[12]UNESCO (2002) Implementing Agenda 21: report to the Secretary-General

[13] UNEP (2010) Clearing the waters: A focus on water quality solutions. Nairobi. Accessed at: www.unep.org/PDF/Clearing_the_Waters.pdf

[14]Wisser*et al*. (2008) Global irrigation water demand: variability and uncertainties arising from agriculture and climate change data sets. Geophysical. 35.

Impacts of Climate Change on Water Resources

The water cycle is being affected by long-term changes in climate. These changes are affecting the predictability of precipitation both in terms of quantity and intensity. Some areas will see increases in precipitation, intensity of weather events and flooding, while other already water stressed areas will experience more extreme drought conditions with increasingly extreme weather events. Both scenarios are problematic for water management. Figure 3 illustrates trends seen in the 20th Century that are likely to continue to intensify during the 21st Century.

These precipitation trends have been assessed and monitored on a regional basis by the UNFCCC and IPCC and subsequent projections made which are increasingly more accurate both spatially and temporally. Table 1 below illustrates the likely water resource impacts by region.

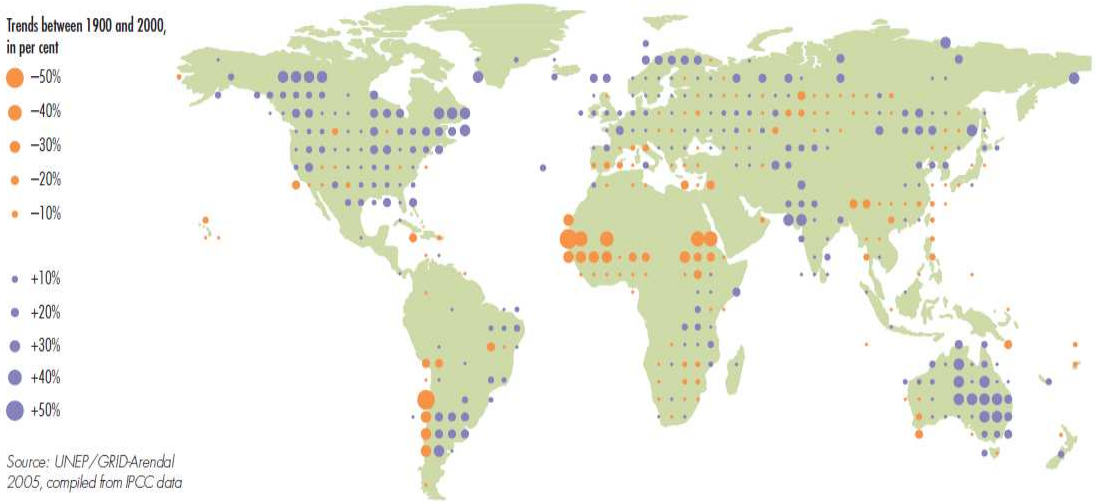

Figure 5: Annual precipitation trends 1900-2000

Source: UNEP/GRID-Arendal, 2005

Table 1: Regional impacts on hydrology and water resources

Region	*Changes predicted of relevance to hydrology and water resources*
Africa	Increase in water-stressed nations: population growth plus degradation of watersheds. Some climate models predict reduction in precipitation and increasing variability. Anthropogenic water pollution and disease likely to increase
Polar Regions	Thaw: more running and standing water, changes in Arctic drainage systems.
Middle East/Arid Asia	Water shortages may be exacerbated; changing in cropping and improved irrigation vital. Glacier melt may boost flow in some rivers temporarily.
Australasia	Variability already high, will increase, a particular threat to drought-prone areas of Australia. However, urban flooding may also increase. New Zealand glaciers will melt, boosting river flow temporarily.
Europe	Essentially split between a generally wetter north and generally drier south. Floodplain development a big issue in the north, pollution and water stress in the south. Up to 95 per cent of Alpine glacier mass likely to melt by 2100: navigation impacts.
Latin America	Arid and semi-arid zones vulnerable to change in water availability. Hydro-power and agricultural production impacted. Impact on water resources could be sufficient to lead to conflicts among users, regions and countries.
North America	Water quality and quantity particularly sensitive to climate change. Potentially wetter winters and drier summers, with much reduced soil moisture. Alternating drought and flood periods.
Small Island States	Freshwater shortages are common but the coastal threat dominates.

Temperate Asia	Decreasing water supply, except in a few basins. Possibly 25 per cent decrease in glacier mass by 2050. Northern China may be particularly vulnerable. Critical uncertainties concern the monsoon and El Niño weather systems.
Tropical Asia	The Himalayas exercise a critical control. Glacial lake outburst floods but a longer-term decrease in headwater runoff. Increased population will place stress on resources, especially in drier zones.

Source: Newson, 2009

Figure 4 below highlights a few of the adaptation strategies and cross-cutting issues that will be encountered for development on a regional basis.

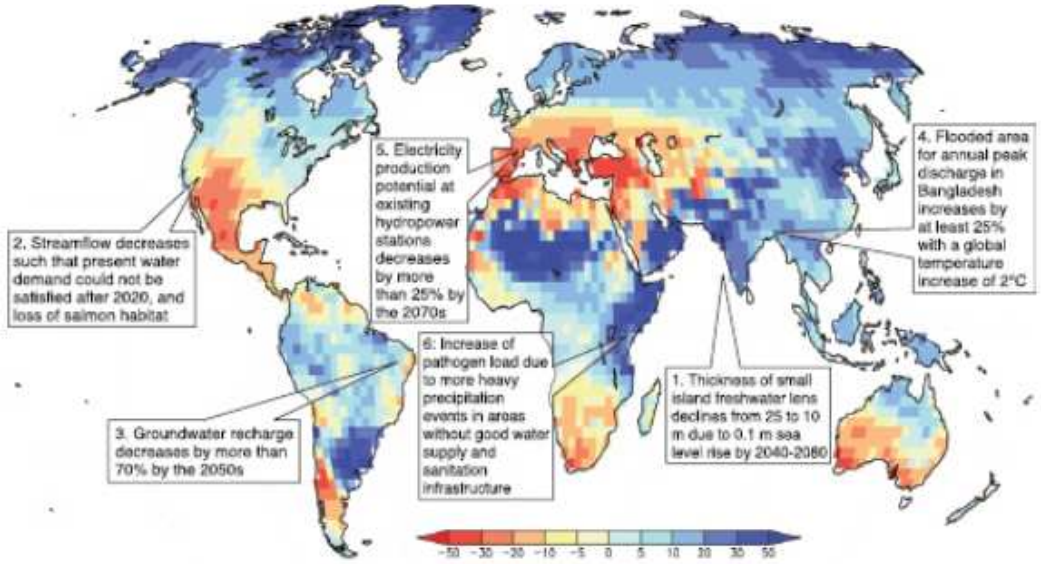

Figure 6: Illustrative map of future climate change impacts on freshwater resources and potential threats to regional development
Source: IPCC, 2007.

Many developed nations have initiated and funded research on climate change impacts on a national level, such as the UK Climate Impacts Programme (UKCIP), and these projections are being incorporated into policy development and adaptation strategies. Globally there is much still to be done to realise the long-term implications for water resource management but also the interactions with the energy, security and food nexus.

Challenges and Conflicts

The starting premise to IWRM is that there is a need to link the drainage basin and aquifer through to the near coastal zone (or inland sea) and to develop an understanding of associated natural flows of water, energy, biota and chemicals. To this are added the changes resulting from engineering structures, whether for abstraction or discharge. When anthropogenic activities are included, dimensions such as health and economic well-being, hazards, legal and cultural rights, ownership and management structures, investment needs and cost-recovery all make the development of understanding extremely complex.[15] Integration of all water resources under one

[15]McDonnell, R. A. (2008) Challenges for Integrated Water Resources Management: How Do We Provide the Knowledge to Support Truly Integrated Thinking? *Water Resources Development.*Vol. 24, No. 1.pp 131–143

umbrella is daunting, IWRM literature in the past 20 years has identified over 41 issues to be integrated under the term of IWRM. This has proven to be unwieldy and unrealistic in an operational capacity.[16] On a regional or global level, vague terminology in the IWRM concept allows for interpretations to be diverse and moulded to fit incumbent processes with a 'business as usual' approach. On the national level, constraints to IWRM implementation stem from institutional isolation of ministerial departments and the inherent barriers to multi-departmental 'buy-in', resource allocation and effort. Data collection, compatibility and coordination are also complex and difficult to reconcile. While data can be collected and analysed for river basin management, coupling this with equivalent and comparable social and economic data that is collected on the same socio-political dimensions is also challenging. The collection of data also comes at a considerable cost to institutions or government departments and as such they are often reluctant or legally constrained when asked to share data, this is a significant hindrance as secondary data is paramount to the success of IWRM.

Much has been achieved since 1992 in efforts to quantify available water resources and track annual trends. Technologies, modelling and simple tools have been developed to drive water resource assessments including water footprinting[17] and the virtual water concept.[18] However, they are expensive for primary assessment and the costs of maintaining installed monitoring systems long enough to expose trends are high. For this reason, many countries globally have still not implemented adequate mechanisms to assess current water supplies from which to make informed decisions.

Water withdrawals have tripled in the last 50 years, largely due to increased irrigation[19]. One third of the countries in water-stressed regions of the world are expected to face severe water shortages in the 21st century. 1.8 billion people will experience absolute water scarcity and over 65 per cent of the world's population could live with moderate or severe water stress. Coupled with the challenges projected by climate change, freshwater resource management will need to remain dynamic, at the top of the political agenda and at the forefront of funding and technological advance.

Way Forward

Globally we are facing increasingly complex challenges towards water resources, quality and associated ecosystems. Effective solutions to these challenges are available and in the developed regions widely used at political, institutional and societal levels. However, there remains a very high degree of variability in the implementation of adequate regulatory regimes. There is still an inequitable level of access for vulnerable people to exert any influence on the management of local water resources and gender inequality in defining legislation, policies, and programs that promote the improvement of water quality and equitable distribution of water resources.[20] More impetus is needed to support effective measures such as education and capacity building, legal, financial, technology and infrastructure, and data and monitoring will ensure progression in this area. Knowledge and good practice sharing in implementation of those measures is fundamental to progression.

[16] Biswas, A. K (2008) Integrated Water Resources Management: Is It Working? *Water Resources Development.* Vol. 24, No. 1.pp 5–22

[17] Introduced by A. Y Hoekstra in 2002 which illustrates the total volume of freshwater used to produce the goods and services consumed by the individual or community or produced by the business.

[18] Heralded by Professor J. A. Allan in the early 1990s as the water embedded in commodities

[19] UNESCO (2009) World Water Development Report (WWDR-3)

[20] UNEP (2010) Clearing the waters: A focus on water quality solutions. Nairobi, ISO 14001:2004-certified. www.unep.org/PDF/Clearing_the_Waters.pdf

More examples of successful IWRM need to be disseminated globally. Nationally, Governments should aim to become an enabler of IWRM by clearly setting the policy framework under which both top-down and bottom-up stakeholder participation in water management is enabled.

Headway with drinking water targets has been successful, but more focus needs to be committed to sanitation provision. Poor disposal of untreated wastewater and sewage sludge is a cross-cutting issue and has serious economic, public health, development potential and food security implications. There needs to be a renewed commitment to ambitious safe water and sanitation targets with focused debates on how to address lagging sanitation improvements, target greater financial investment in sanitation infrastructure, capacity building and development of innovative technologies and processes. Another global target for sanitation and resources allocated to achieve it are needed following the MDG 2015 target.

Climate change adaptation strategies include developing temporally and spatially accurate climate projections and including these projections in macro and meso-scale IWRM, planning policies and behaviour change management. UNFCCC Annex-I parties that have initiated and funded research at the national level should be encouraged to export good practice, modelling technologies and expertise to less developed nations in order to generate more globally accurate information.

Chapter 19: Environmentally sound management of toxic chemicals, including prevention of illegal international traffic in toxic and dangerous products

Introduction

Chemicals continue to play a significant role in the development and growth of economies, improving healthcare, crop protection, living standards and the efficiency of industrial processes. The production and application of chemicals on a large-scale began during the industrial revolution and increased considerably following the end of the Second World War. Most notable was the widespread global use of DDT as an insecticide and disease control agent. However, following the discovery that DDT was having adverse environmental and health effects, the importance of proper regulation and management of chemicals was recognised. The United Nations Conference on the Human Environment in 1972 identified the need for international cooperation to manage chemicals and specifically noted the importance of regulating agro-chemical and pesticide use as well as toxic chemicals entering aquatic systems. It recommended the formation of an International Registry of Data on Chemicals in the Environment to provide information on potentially harmful chemicals[1]. Agenda 21 acknowledges the crucial role that chemicals can play in achieving sustainable development, but emphasises the importance of sound management of toxic chemicals. Chapter 19 outlines six programme areas for action[234]:

- expanding and accelerating international assessment of chemical risks
- harmonization of classification and labelling of chemicals
- information exchange on toxic chemicals and chemical risks
- establishment of risk reduction programmes
- strengthening of national capabilities and capacities for management of chemicals
- prevention of illegal international traffic in toxic and dangerous products

Implementation

There are currently 17 multilateral environment agreements (MEAs) and 21 intergovernmental organisations dealing with the management and regulation of chemicals. These include the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer, the 1998 Rotterdam Convention on Prior Informed Consent Procedure for Certain Hazardous Chemicals, the 2001 Stockholm Convention on Persistent Organic Pollutants, and the 2006 Strategic Approach to International Chemicals Management (SAICM). Most recently at the UNEP Governing Council meeting in 2009 governments agreed to create a new legally binding instrument on the management of mercury, with the aim of it being established in 2013. [56]

In 2002 the Johannesburg Plan of Implementation renewed the commitments to chemical management set out in Agenda 21, and set a target that by 2020 chemicals should be used and

[1] Action Plan for the Human Environment, Stockholm 1972, http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=97&ArticleID=1504&l=en
[2] Review of implementation of Agenda 21 and the Johannesburg Plan of Implementation (JPOI): Chemicals http://daccess-ods.un.org/access.nsf/Get?Open&DS=E/CN.17/2010/5&Lang=E
[3] Practices in the Sound Management of Chemicals : 2010 - http://www.un.org/esa/dsd/resources/res_pdfs/publications/sdt_toxichem/practices_sound_management_chemicals.pdf
[4] Agenda 21, Chapter 19 http://www.un.org/esa/dsd/agenda21/res_agenda21_19.shtml
[5] Practices in the Sound Management of Chemicals : 2010 - http://www.un.org/esa/dsd/resources/res_pdfs/publications/sdt_toxichem/practices_sound_management_chemicals.pdf
[6] Global Environment Outlook – GEO4, 2007, http://www.unep.org/geo/geo4.asp

produced in ways that lead to the minimization of significant adverse effects on human health and the environment.[7]

In order to achieve this 2020 target SAICM was set up to provide a non-binding policy framework for chemicals management. A network of national, regional and international focal points have been set up under the SAICM framework to enable better communication and access to tools such as SAICM's Quick Start Programme, which offers financial support to developing countries, and an Information Clearing House which facilitates access to information and expertise. As of May 2011, over 171 governments, 74 NGOs and 12 intergovernmental organisations have designated SAICM focal points.[89]

Agreements at the regional level include the European Union's REACH[10]. The REACH legislation (Registration, Evaluation, Authorisation and Restriction of Chemicals), that entered into force in June 2007, requires producers and importers of chemicals to prove that substances in widely-used products are safe, while the properties of chemicals produced or imported into the EU have to be registered with a central agency.[11]

Risk Analysis

Agenda 21 called for the strengthening of international risk assessment on chemicals. Progress has been made, but mainly in developed countries, with most of the responsibility for assessment transferred to industry. The average number of chemicals risk assessments undertaken from 2001 to 2009 compared to 1995 and 2000 has multiplied sevenfold[12]. At a global level the joint WHO/UNEP/ILO International Programme on Chemical Safety (IPCS) has been the main body responsible for developing new risk assessment criteria and methodologies for chemicals[13]. Concise International Chemical Assessment Documents (CICADs) are published regularly by IPCS and provide a summary of all the relevant scientific information on the effects of specific chemicals on human health and the environment. Since 1998, 77 such documents have been produced; however progress in developing them has slowed recently due to financial constraints.[1415] The IPCS also works closely with other organisations such as the OECD, under the auspices of the Interorganisation Programme for the Sound Management of Chemicals (IOMC)[16], to prevent duplication of risk assessments.[17] The OECD has conducted over 1000 chemical risk assessments to date through its Cooperative Chemicals Assessment Programme, and continues to add more to its extensive database[18]. However there has been criticism regarding the lack of risk assessments carried out on combined chemical usage, with most assessments conducted on a chemical-by-chemical basis.[19]The IPCS has discussed methods for assessing combined risks from multiple chemicals, and subsequently developed a draft framework for

[7] Johannesburg Plan of Implementation, 2002 http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/WSSD_PlanImpl.pdf
[8] SAICM - http://www.saicm.org/
[9] SAICM Information Bulletin No.1, 2008, http://www.saicm.org/documents/Publications/SAICM%20Information%20Bulletin%20No%201%20Jan%202008.pdf
[10] Practices in the Sound Management of Chemicals : 2010 - http://www.un.org/esa/dsd/resources/res_pdfs/publications/sdt_toxichem/practices_sound_management_chemicals.pdf
[11] Global Environment Outlook – GEO4, 2007, http://www.unep.org/geo/geo4.asp
[12]Trends in Sustainable Development – Chemicals, Mining, Transport, Waste Management:2010-2011 - www.un.org/esa/dsd/resources/res_pdfs/publications/trends/trends_Chemicals_mining_transport_waste/ch1_chemicals.pdf
[13] International Programme on Chemical Safety - http://www.who.int/ipcs/en/
[14] Review of implementation of Agenda 21 and the Johannesburg Plan of Implementation (JPOI): Chemicals http://daccess-ods.un.org/access.nsf/Get?Open&DS=E/CN.17/2010/5&Lang=E
[15]Concise International Chemical Assessment Document 77, 2010, http://www.who.int/ipcs/publications/cicad/cicad77.pdf
[16] The IOMC brings together nine intergovernmental organizations actively involved in chemical safety: FAO, ILO, UNDP, UNEP, UNIDO, UNITAR, WHO, World Bank and OECD.
[17] WHO IPCS, Health impacts of chemicals, http://www.who.int/ipcs/assessment/en/
[18] http://webnet.oecd.org/hpv/ui/OverallStatus.aspx
[19] European Public Health Alliance http://www.epha.org/a/3814

carrying out assessments. However it still requires further development before widespread implementation.[20]

Labelling

Significant progress has been made in developing a Globally Harmonized System of Classification and Labelling of Chemicals (GHS), as recommended by Agenda 21. A coordinating group under the IOMC was set up to develop the GHS, the first edition of which was published in 2003, and has since been updated every two years – this only narrowly missed the Agenda 21 target of making a globally harmonized classification system available by the year 2000. It addresses classification of chemicals by types of hazard and proposes harmonized hazard communication elements, including labels and safety data sheets.[21] As of June 2011, 67 countries have implemented GHS into their national frameworks for chemical labelling and classification, while others are currently revising their national guidelines.[22]

In 2001 UNITAR and ILO, both part of IOMC, set up the Global GHS Capacity Building Programme which provides guidance documents, awareness-raising and training materials to aid countries in their national GHS implementation strategies.[23]

Information Exchange

Prior to Agenda 21, the London Guidelines for the Exchange of Information on Chemicals in International Trade recognised the importance of making information on chemicals readily available to governments for use in risk assessments and regulation. The London Guidelines also introduced a Prior Informed Consent procedure for regulating imports and exports of potentially harmful chemicals.[24]Agenda 21 acknowledged the importance of "promoting intensified exchange of information on chemical safety, use and emissions among all involved parties", and specifically called for the full implementation of the PIC procedure. Subsequently the Rotterdam Convention was adopted in 1998, creating a legally binding framework for PIC, based on the London Guidelines version. The Rotterdam Convention currently has 143 Parties and came into force in 2004.[25] Several other mechanisms have also been created to facilitate information exchange. These include Pollutant Release and Transfer Registers (PRTRs), national or regional database systems detailing the release and transfer of potentially dangerous chemicals which are, or will soon be, available in about 50 countries[26]. The IPCS produce International Chemical Safety Cards (ICSC) which provide health and safety information on chemicals and assist in the implementation of GHS. There are currently over 1600 ICSCs, available in 17 different languages.[27] There is also OECD's Global Portal to Information on Chemical Substances (eChemPortal)[28] and SAICM's Information Clearing House, which has incorporated much of the Information Exchange Network on Capacity-building for the Sound Management of Chemicals (INFOCAP), previously administered by WHO[29]. Although much more information on chemicals is now available, there is still room for improvement, especially with regards to data on chemical safety and toxicity and its availability in national and local languages[30].

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[20] WHO IPCS Assessment of combined exposures to multiple chemicals http://www.who.int/ipcs/methods/harmonization/areas/aggregate/en/index.html
[21] Globally Harmonized System of Classification and Labelling of Chemicals (GHS) - http://live.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html
[22]GHS Implementation - http://live.unece.org/trans/danger/publi/ghs/implementation_e.html
[23]UNITAR – UHS http://www.unitar.org/cwm/ghs
[24] London Guidelines - http://www.chem.unep.ch/irptc/irptc/lguide.html
[25]Rotterdam Convention - www.pic.int/
[26] PRTR http://www.prtr.net/en/
[27]International Chemical Safety Cards, WHO http://www.who.int/ipcs/publications/icsc/en/
[28]eChemPortalhttp://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
[29]SAICM Information Clearing House, http://www.saicm.org/ich/
[30] Policy options and actions for expediting progress in implementation: chemicals - Report of the Secretary-General, CSD19, 2011

Risk Reduction

Risk Reduction Programmes have been implemented via several international conventions and protocols mentioned above. Risk Reduction is the first of five key objectives under SAICM which, in its Global Plan of Action, details 79 activities that can be implemented to achieve the objective.[31] The Stockholm Convention requires Parties to reduce the release of Persistent Organic Pollutants into the environment and provides guidelines on Best Available Techniques (BATs) and Best Environmental Practices (BEPs) for achieving this[32]. At the global policy level arguably the most successful risk reduction programme is the Montreal Protocol which has helped facilitate the phase-out of over 95% of the ozone depleting substances (ODSs) it was designed to control, via multilateral funding and trade sanctions.[33] Industry has also played a part in reducing risks. The ICCA's (International Council of Chemical Associations) Responsible Care Programme is helping the chemical industry improve its health, safety and environmental performance, and its Global Product Strategy aims to enhance the industry's life cycle management of chemicals.[34]So far 53 chemical industry associations, representing 90% of the global chemical industry, have adopted Responsible Care, yet it is debatable whether the program has achieved any significant results. For instance, one of the aims of the program is pollution reduction within the chemical industry, yet one study has shown that chemical plants participating in Responsible Care do not reduce their pollution when compared to equivalent non-participants. It is argued that self-regulation programs, such as Responsible Care, do not provide the necessary enforcement to achieve significant results.[35]

National Capabilities

Many countries, particularly those still developing, are yet to create strong national frameworks and institutions for managing chemicals, as suggested in Agenda 21. Current institutional infrastructure tends to be quite fragmented or inadequate, mainly because sound management of chemicals in many developing countries is simply not a priority in terms of their development policies and, consequently, tends to be underfunded. [36]

Illegal International Traffic

One of the most important instruments for the prevention and control of illegal international traffic in chemicals is information-sharing and capacity-building of developing countries. Therefore some of the mechanisms mentioned above such as the GHS, SAICM and the Rotterdam Convention are important instruments for enabling developing countries to obtain information on the quantities and types of chemicals involved and methods used in illegal trafficking and strengthen their national capacity to deal with it.[37]As well as facilitating information exchange regarding chemicals that have been banned or restricted, the Rotterdam Convention's prior informed consent procedure provides a mechanism with which Parties can formally decide whether or not to allow the import of hazardous chemicals listed under the Convention.[38] Other initiatives are also involved in monitoring and preventing trafficking such as

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http://www.un.org/esa/dsd/csd/csd_pdfs/csd-19/sg-reports/SG-Report-on-Chemicals-CSD19-final-single-spaced.pdf

[31] SAICM texts and resolutions of the International Conference on Chemicals Management http://www.saicm.org/documents/saicm%20texts/SAICM_publication_ENG.pdf

[32]Stockholm Convention, BAT/BEP Guidelines http://chm.pops.int/Implementation/BATBEP/Guidelines/tabid/187/language/en-GB/Default.aspx

[33] Phasing Out ODS: Protecting the Ozone Layer & Safeguarding the Global Climate, UNDP, 2009 - http://content.undp.org/go/cms-service/download/publication/?version=live&id=3287350

[34] ICCA, Responsible Care http://www.icca-chem.org/en/Home/Responsible-care/

[35]Gamper-Rabindran& Finger, 2010, Does Self-Regulation Reduce Pollution? Responsible Care In The Chemicals Industry http://www.pitt.edu/~shanti1/papers/gamper_finger_responsiblecare.pdf

[36] Policy options and actions for expediting progress in implementation: chemicals - Report of the Secretary-General, CSD19, 2011 http://www.un.org/esa/dsd/csd/csd_pdfs/csd-19/sg-reports/SG-Report-on-Chemicals-CSD19-final-single-spaced.pdf

[37] Review of implementation of Agenda 21 and the Johannesburg Plan of Implementation (JPOI): Chemicals http://daccess-ods.un.org/access.nsf/Get?Open&DS=E/CN.17/2010/5&Lang=E

[38] Rotterdam Convention At a Glance http://www.basel.int/pub/joint-info-kit/Rotterdam-leaflet.pdf

the Green Customs Initiative which enhances collaboration between several international organisations, including Interpol, the World Customs Organisation and relevant MEA secretariats. It aims to enhance the capacity of customs officials and other enforcement personnel to detect and prevent illegal trafficking in environmentally-sensitive materials, such as ODS and other toxic chemicals, while facilitating legal trade.[39]However, despite the various organisations and initiatives involved, illegal trafficking in toxic chemicals remains a serious global problem, with pesticides, ODS and more recently electronic waste (which contains high levels of toxic chemicals – see chapter on hazardous waste) of particular concern, most notably in Africa where the illegal trafficking and subsequent mismanagement and dumping of chemicals has widespread public health and environmental consequences.[40]

Challenges and Conflicts

The global chemical industry continues to grow at a phenomenal rate, with production of chemicals increasing at a rate of 3-4% each year and about 1000 new chemicals entering the market annually.[41] The share of chemical production and consumption in developing countries is increasing, and by 2020 will account for over a third of global chemicals consumption (it currently stands at about 25%). As many of the challenges being faced in implementing sound management of chemicals are found in developing countries, it is important that these are addressed.[42]

There is an established link between poverty and increased exposure to toxic chemicals, yet despite attempts to provide new financial mechanisms for poorer countries, there remains a major lack of financial resources available for improving the management of chemicals. Developing countries rely on bilateral and multilateral funding, and although mechanisms such as SAICMs Quick Start Programme and the Global Environment Facility have helped, the consensus is that they are insufficient to achieve the goals set out in Agenda 21 and the Johannesburg Plan of Implementation. These financial challenges are not helped by the fact that chemical management is sidelined by more immediate priorities in developing countries such as infrastructure and human development needs. Thus the development aid, available from donor countries and regional development banks is often not tapped into for the purpose of improving chemical management.[43]

Many developing countries lack the basic institutional, legal and technical capacity to implement the various chemical management strategies recommended by international conventions and frameworks such as SAICM. For instance increasing agricultural production is often a major priority for developing countries, and leads to increased pesticide use. However there is generally a lack of provision for assessing the risks of pesticides and the possibilities of alternative biological control management or organic production, and the pesticides are often illegally obtained, wrongly labelled and mishandled.[44]Likewise, mining activities are also an important driver for economic development but the environmental and social impacts of chemicals used in

[39] Green Customs Initiative http://www.greencustoms.org/background/
[40] Preliminary draft report on illegal traffic in toxic and dangerous products, SAICM, 2010 - http://www.saicm.org/documents/meeting/afreg/Abidjan%202010/Meeting%20docs/Afr3%20INF16_Illegal%20traffic.pdf
[41] Trends in Sustainable Development – Chemicals, Mining, Transport, Waste Management:2010-2011 - www.un.org/esa/dsd/resources/res_pdfs/publications/trends/trends_Chemicals_mining_transport_waste/ch1_chemicals.pdf
[42] Trends in Sustainable Development – Chemicals, Mining, Transport, Waste Management:2010-2011 - www.un.org/esa/dsd/resources/res_pdfs/publications/trends/trends_Chemicals_mining_transport_waste/ch1_chemicals.pdf
[43] Practices in the Sound Management of Chemicals : 2010 - http://www.un.org/esa/dsd/resources/res_pdfs/publications/sdt_toxichem/practices_sound_management_chemicals.pdf
[44] Policy options and actions for expediting progress in implementation: chemicals - Report of the Secretary-General, CSD19, 2011 http://www.un.org/esa/dsd/csd/csd_pdfs/csd-19/sg-reports/SG-Report-on-Chemicals-CSD19-final-single-spaced.pdf

extraction processes are often neglected. Gold mining, for example, often involves the use of cyanide and mercury which can enter and contaminate water supplies and soil if not managed safely.[45] Many developing countries have yet to institute regulatory frameworks that place the burden of risk management on industry, and there are therefore significant gaps in national legislation to deal with this problem. The root cause of poor institutional capacity at the national level can generally be attributed to low levels of finance, so increasing funding for chemicals management remains a major priority to provide the means to strengthen institutions.[46]

Information sharing with regards to chemical safety and management still needs to be enhanced. Public awareness of the risks involved in handling chemicals, as well as their potential adverse effects on the environment, is still lacking despite improvements to the accessibility of information. One of the reasons that chemicals do not often take centre stage in government policies and frameworks is that decision-makers are not aware of the broad affects that chemicals have on a wide range of areas, from drinking water and health, to biodiversity and poverty. With improved dissemination of information comes greater awareness of the importance of chemicals in development.[47]

Another challenge is the lack of coherence in chemicals legislation, both at the international and national level. Chemicals management is usually not the sole responsibility of one government department or ministry, due to its cross-sectoral nature. This leads to uncoordinated legislation and management, and is a major problem in poorer countries where resources are limited. At the international level, the growing number of multilateral agreements and international frameworks related to chemicals only adds to this problem.[48]

As well as the challenges above, there are also emerging issues that need to be dealt with. Nanotechnology, electronic waste and chemicals in products are of particular concern. At CSD-18,parties raised the issue of nanotechnology being used in industrial and food products, and suggested that nanoparticles be classed as new chemicals due to their potential health risks. Likewise the use of toxic chemicals found in e-waste needs to be addressed, as does the illegal trafficking of this waste to developing countries.[49]

Way Forward

Enhancing the technical and financial support available to developing countries is of the upmost importance given the increasing proportion of chemical production and consumption taking place in these countries. Many solutions have been proposed at recent international meetings. These include mainstreaming of sound management of chemicals into the broader development aid agenda, the introduction of public-private partnerships, a new multilateral fund for chemicals and the introduction of sound management of chemicals and wastes as a new GEF focal area.[50]

National infrastructures for chemical management need to be strengthened to improve the implementation of SAICM, Rotterdam, Stockholm and other conventions. Governments should mainstream chemicals management into their development planning processes, including

[45] Goetz, A. (2007) The Price of Gold: The Environmental Impacts of Toxic Chemicals in Gold Mining http://digitalcollections.sit.edu/cgi/viewcontent.cgi?article=1143&context=isp_collection
[46] Practices in the Sound Management of Chemicals : 2010 - http://www.un.org/esa/dsd/resources/res_pdfs/publications/sdt_toxichem/practices_sound_management_chemicals.pdf
[47] Ibid
[48] Ibid
[49] Policy options and actions for expediting progress in implementation: chemicals - Report of the Secretary-General, CSD19, 2011 http://www.un.org/esa/dsd/csd/csd_pdfs/csd-19/sg-reports/SG-Report-on-Chemicals-CSD19-final-single-spaced.pdf
[50] Synergies Success Stories http://www.un.org/esa/dsd/resources/res_pdfs/publications/sdt_toxichem/synergies_success_stories.pdf

indicators and targets to encourage greater urgency in achieving sustainable chemicals management, and enhance cooperation between ministries. Greater responsibility should be placed on chemical manufacturers to carry out risk assessments and implement safety procedures, while a life-cycle approach to managing chemicals should be adopted to ensure safe and sustainable management from the manufacturing phase through to final disposal. Current legislation aimed at promoting producer responsibility, such as the EU's REACH and WEEE Directives and the ICCA's Responsible Care Programme, should be strengthened and enforcement procedures enhanced.

At the international level policy frameworks for chemicals also need to be strengthened, and the full global implementation of SAICM and the GHS should be pursued. [51]It is vital that information on chemical hazards and safety guidelines are disseminated globally to ensure every country has access to the most up-to-date information available; information transfer, as well as capacity building mechanisms, must be improved, particularly in developing countries. Research and development of alternatives to toxic chemicals should also be enhanced, and information about current alternatives made more widely available. There also needs to be greater collaboration between international mechanisms; cooperation between the Basel, Rotterdam and Stockholm conventions, for example, is being addressed through a "synergies process" which has helped to enhance resource efficiency, provide more coherent policy guidance and reduce administrative costs. This highlights how existing international governance mechanisms can be enhanced through better coordination.[52]Finally emerging policy issues around e-waste and nanotechnology also need be addressed and appropriate legislation and management strategies implemented.[53]

[51]Policy options and actions for expediting progress in implementation: chemicals - Report of the Secretary-General, CSD19, 2011 http://www.un.org/esa/dsd/csd/csd_pdfs/csd-19/sg-reports/SG-Report-on-Chemicals-CSD19-final-single-spaced.pdf
[52]Synergies Success Stories, UNDESA http://www.un.org/esa/dsd/resources/res_pdfs/publications/sdt_toxichem/synergies_success_stories.pdf
[53] Policy options and actions for expediting progress in implementation: chemicals - Report of the Secretary-General, CSD19, 2011 http://www.un.org/esa/dsd/csd/csd_pdfs/csd-19/sg-reports/SG-Report-on-Chemicals-CSD19-final-single-spaced.pdf

Chapter 20: Environmentally Sound Management of Hazardous Wastes, Including Prevention of Illegal International Traffic in Hazardous Wastes

Introduction

Hazardous waste is waste that poses substantial or potential threats to public health or the environment and generally exhibits one or more of these characteristics: carcinogenic, ignitable (i.e., flammable), oxidant, corrosive, toxic, radioactive and explosive.[1]Effective management of the production, storage, transportation and disposal of hazardous waste was identified in Agenda 21 as being "of paramount importance for proper health, environmental protection and natural resource management, and sustainable development". The overall objective of Chapter 20 is to prevent and minimize the production of hazardous wastes to the extent possible, and to manage wastes in such a way, as to avoid damage to health and the environment. Chapter 20 is sub-divided into four programme areas, which include:

- Promoting the prevention and minimization of hazardous waste;
- Promoting and strengthening institutional capacities in hazardous waste management;
- Promoting and strengthening international cooperation in the management of transboundary movements of hazardous wastes;
- Preventing illegal international traffic in hazardous wastes.[2]

Implementation

Hazardous Waste Prevention and Minimisation

Hazardous waste has become a major global environmental and health problem. Despite the overall objective of Agenda 21 to prevent and minimise its production, there have been rapid increases in the volumes of hazardous, as well as solid and non-hazardous wastes globally, as a result of economic growth, industrialisation and urbanisation. Data on global waste in general is notoriously unreliable, due to the lack of waste management and reporting in many countries, inconsistent reporting methods, and conflicting definitions of types of waste, particularly in developing countries.[3] However the Basel Convention estimated in 2001 that 338 million tons of hazardous waste had been generated in a year by its Parties. More recently the World Waste Survey estimates 490 million tonnes of hazardous waste was produced in 2006 from manufacturing industries alone.[4]

Electrical and electronic waste (e-waste) has become a particular concern in recent years. E-waste, which includes televisions, computers and refrigerators, is classified as hazardous due to the presence of toxic chemicals and heavy metals.[5] A single computer, for example, contains about two kilograms of lead, as well as other metals such as cadmium and mercury, and inorganic chemicals that can be harmful if released into the environment or ingested.[6] Estimates indicate

[1]Review of implementation of Agenda 21 and the Johannesburg Plan of Implementation (JPOI): Waste Management, CSD 18, 2010http://daccess-ods.un.org/access.nsf/Get?Open&DS=E/CN.17/2010/6&Lang=E

[2]Agenda 21 Chapter 20: http://www.un.org/esa/dsd/susdevtopics/sdt_wasthaza.shtml

[3]Review of implementation of Agenda 21 and the Johannesburg Plan of Implementation (JPOI): Waste Management, CSD 18, 2010http://daccess-ods.un.org/access.nsf/Get?Open&DS=E/CN.17/2010/6&Lang=E

[4]From Waste to Resource: World Waste Survey 2009 http://www.veolia-environmentalservices.com/veolia/ressources/files/1/927,753,Abstract_2009_GB-1.pdf

[5] Review of implementation of Agenda 21 and the Johannesburg Plan of Implementation (JPOI): Waste Management, CSD 18, 2010http://daccess-ods.un.org/access.nsf/Get?Open&DS=E/CN.17/2010/6&Lang=E

[6] Preliminary draft report on illegal traffic in toxic and dangerous products, SAICM, 2010

20-50 million tonnes of e-waste are produced annually worldwide, while in Europe e-waste is increasing by 3-5% each year. The contribution of computers, mobile telephones and televisions to global e-waste in particular is expected to double between 2010 and 2015.[7]

Despite the overall increase in the production of hazardous wastes globally, there have been some efforts to address this issue in developed and developing countries alike. Agenda 21 placed importance on the development of both regulatory frameworks and market mechanisms to provide incentives to reduce the production of hazardous waste, and called for the development of policies and programmes at national and regional levels – including through the development of standards and the regulation of industry. It recognised that the implementation of policies designed to prevent or minimise hazardous waste required the strengthening of institutional capacity at multiple levels. The provisions outlined in Agenda 21 have been integrated into national and regional policies at a number of levels, even if global trends provide a more concerning picture.

At an EU level hazardous waste is addressed by several directives. The Waste Electrical and Electronic Equipment (WEEE) Directive aims to reduce the amount of e-waste being produced as well as promote its safe collection, recycling and recovery, and was adopted in 2003[8]alongside the Restriction of Hazardous Substances Directive, which restricts the use of six hazardous chemicals (including lead and mercury) in the manufacture of electrical goods.[9]The WEEE Directive requires member states to meet targets for collection and recycling based on the weights and quantities of electrical equipment sold in each country. The directive also imposes greater responsibility on the manufacturers of electrical goods to provide the financial costs needed for safe management of e-waste. However despite these stringent rules, only one third of e-waste is reported to be separately collected and treated in the EU, with the other two thirds likely to be going to landfill, other sub-standard treatment sites or illegally exported outside the EU.[10]

The revised Waste Framework Directive, which in 2010 incorporated the 1991 Hazardous Waste Directive, requires Member States to take a cradle-to-grave approach to controlling hazardous waste, with complete life-cycle management of waste from production to final disposal or recovery. The Directive also includes obligations on banning the mixing of hazardous waste, as well as improving labelling and monitoring. In addition the EU has stated that all Member States should have a national waste prevention programme in place by 2013 which should set out objectives and measures for the prevention of all waste, including hazardous.

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http://www.saicm.org/documents/meeting/afreg/Abidjan%202010/Meeting%20docs/Afr3%20INF16_Illegal%20traffic.pdf

[7] Trends in Sustainable Development – Chemicals, Mining, Transport, Waste Management: 2010-2011, UNDESA http://www.un.org/esa/dsd/resources/res_publtrends_2010_topics.shtml

[8] European Commission, WEEE Directive, 2003, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2002L0096:20080321:EN:PDF

[9] European Commission, Restriction of Hazardous Substances Directive, 2003, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:037:0019:0023:EN:PDF

[10] European Commission, Recast of the WEEE Directive, http://ec.europa.eu/environment/waste/weee/index_en.htm

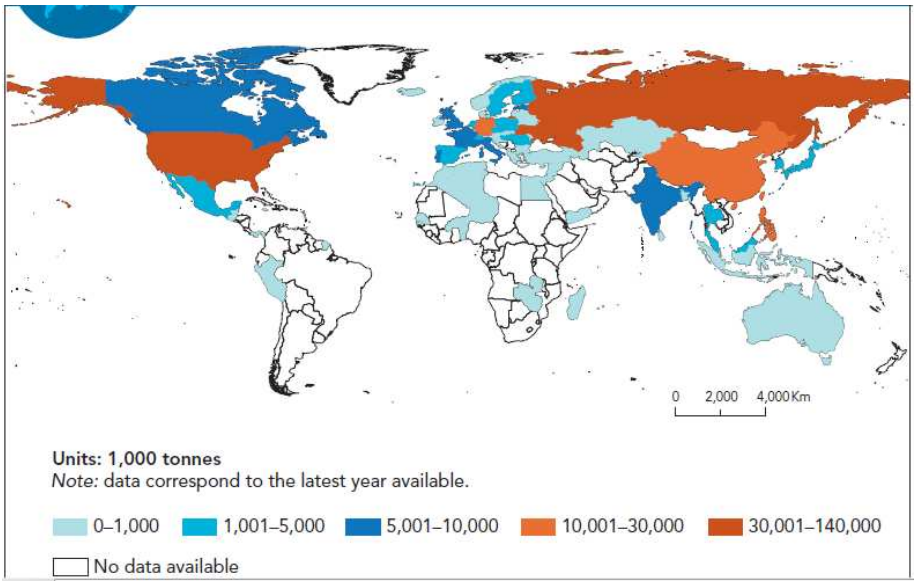

Figure 1. Hazardous waste generation, as at 2007 (or latest figure available)
Source: UNDESA, Trends in Sustainable Development – Chemicals, Mining, Transport, Waste Management: 2010-2011

Transboundary Hazardous Waste and International Cooperation

Trans-border movements of hazardous waste are of particular global concern, as noted in Agenda 21. The Basel Convention estimates trans-border movements are close to 9 million tonnes. This figure is based on calculations from reports of countries signed up to the convention, and does not include the millions of tonnes that undoubtedly go unreported.[11]In particular, trans-border movements of e-waste have become a major problem in recent years; over 90% of computers disposed of in developed countries are reportedly exported to developing countries such as China, Ghana, Nigeria, Pakistan, and India. Supposedly this is for the purpose of recycling and reuse, but often on its arrival the waste is not managed properly and is simply dumped in landfills, allowing toxic chemicals and metals to be released into the environment and contaminate land and water supplies.[12]

In spite of these sobering statistics, there have been a range of international, regional and national efforts and initiatives to address challenges related to the transboundary movement of hazardous wastes.

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal is the principle international agreement on hazardous wastes and entered into force in 1992. It prohibits the export of hazardous wastes to Antarctica, to countries not party to the Convention, or to those that have banned the import of hazardous wastes. It also implements a prior informed consent (PIC) procedure, whereby importing countries must give consent to the transfer of waste before it can take place. Any transboundary movement of waste that takes place without prior consent or with falsified consent is deemed illegal. The Convention has also established 14 regional centres, to help improve capacity building and technology transfer in

[11] Policy options and actions for expediting progress in implementation: Waste Management, CSD19, 2011 http://www.un.org/esa/dsd/csd/csd_pdfs/csd-19/sg-reports/CSD-19-SG-report-waste-management-final-single-spaced.pdf
[12] Trends in Sustainable Development – Chemicals, Mining, Transport, Waste Management: 2010-2011, UNDESA http://www.un.org/esa/dsd/resources/res_publtrends_2010_topics.shtml

relation to hazardous waste management in the most vulnerable regions of the world.[13]As of June 2011 there are 176 parties to the Basel convention.[14]

The Basel convention has attempted to strengthen its regulations and adapt to emerging issues. The Ban Amendment which seeks to prohibit all exports of waste from OECD and EU countries was adopted in 1995 but is yet to enter into force due to disagreements among parties. Likewise the Protocol on Liability and Compensation which addresses financial responsibilities following damage from hazardous waste is also yet to be fully ratified, having been passed in 1999.[15]More recently though the Mobile Phone Partnership Initiative (MPPI) was successfully launched, with 12 manufacturers entering into partnership with the Basel Convention and cooperating with stakeholders to develop and promote the environmentally sound management of end-of-life mobile phones. Based on this initiative the Partnership for Action on Computing Equipment (PACE) was setup in 2008 to help develop technical guidelines for the sound management of used and end-of-life computer equipment.[16]

At a regional level the Bamako Convention in Africa, also referred to in Agenda 21, shares many similar provisions with the Basel Convention, but, crucially, it places an outright ban on the import of hazardous wastes into any of the signatory countries in Africa, and limits transfer within the continent. The Convention, which came into force in 1998, came about after concerns from African countries that the Basel Convention had failed to prohibit the export of hazardous wastes to developing countries.[17] Similar to the Bamako Convention is the Waigani Convention which came into force in 2001. The Convention aims to reduce or eliminate the Transboundary movements of hazardous and radioactive wastes in the Pacific Forum region, while also minimising production and ensuring the environmentally sound disposal of these wastes in the region.[18]

Illegal International Traffic in Hazardous Wastes

Illegal trafficking under the Basel Convention is defined as any transboundary movement of waste that occurs without prior notification to those countries affected; without any prior consent from those countries; if consent is received through misrepresentation or fraud; if movements do not conform to documentation; or deliberate dumping occurs in contravention to the Convention or international law.[19] The Bamako Convention also provides a similar definition and both conventions require member states to introduce national laws to punish and prevent illegal trafficking, but the Bamako Convention takes a slightly stronger stance by imposing criminal penalties on those involved.[20] However, neither convention has any enforcement or monitoring mechanisms in place to implement strategies to prevent illegal trafficking, and both conventions are reliant on parties to establish their own national strategies.

There are also other international initiatives that have been set up to contend with illegal trafficking. The Green Customs Initiative is a global partnership enhancing collaboration to prevent illegal trade in environmentally-sensitive products such as hazardous waste. It aims to

[13] Basel Convention http://untreaty.un.org/cod/avl/ha/bcctmhwd/bcctmhwd.html
[14] Basel Convention http://www.basel.int
[15] Selin, H, 2011, Global governance and regional centers: multilevel management of hazardous chemicals and wastes http://www.sciencedirect.com/science/article/pii/S1877042811001881
[16] Policy options and actions for expediting progress in implementation: Waste Management, CSD19, 2011 http://www.un.org/esa/dsd/csd/csd_pdfs/csd-19/sg-reports/CSD-19-SG-report-waste-management-final-single-spaced.pdf
[17] Preliminary draft report on illegal traffic in toxic and dangerous products, SAICM, 2010 http://www.saicm.org/documents/meeting/afreg/Abidjan%202010/Meeting%20docs/Afr3%20INF16_Illegal%20traffic.pdf
[18]SPREP, The Waigani Convention http://www.sprep.org/factsheets/waigani/factsheetwc001.htm
[19] Basel Convention, Illegal Traffic http://www.basel.int/legalmatters/illegtraffic/index.html
[20] Ogunlade, A., Can The Bamako Convention Adequately Safeguard Africa's Environment In The Context Of Transboundary Movement Of Hazardous Wastes?

enhance the capacity of customs officials and other enforcement personnel to detect and prevent illegal trafficking while facilitating legal trade.[21] The Initiative provides local, regional and national training workshops as well as training materials for customs officials.

The Seaport Environmental Security Network (SESN) is a network of professionals involved in monitoring and inspecting shipments of hazardous waste, and collaborating with governments and international groups, such as Interpol, the Basel Convention and the Green Customs Initiative to improve enforcement and detection methods for preventing illegal shipments.[22] The SESN carried out coordinated cross-border inspections in 2010 which identified the importance of collaboration and what is needed in terms of capacity building and support, in order to improve enforcement and detection.[23]

Challenges and Conflicts

Transboundary Dumping of Hazardous Waste

Illegal trafficking and transboundary dumping is the major challenge associated with hazardous waste. There have been hundreds of examples over the years of serious illegal dumping acts with severe environmental and health consequences. In 1987 there was the infamous Koko Port incident in Nigeria, where two Italian companies were discovered paying a resident to use his land as a dumping ground for over 18,000 drums of toxic waste. This illegal dump was linked to a range of subsequent health issues including birth defects, cancers, paralysis and deaths[24]. More recently, in 2006 there was the Abidjan disaster, where a ship chartered by a Dutch company dumped 500 tons of chemical waste in sixteen different sites across the city of Abidjan in Cote d'Ivoire. The waste contaminated the city's water supplies and fisheries, resulting in the death of at least 17 people, and injuries to at least 10,000[25]. In 2009, 89 containers with 1,500 tons of mixed waste were illegally shipped from the UK to Brazil. The shipments, which were discovered by Brazilian authorities, contained hazardous materials including used syringes, batteries and diapers along with mixed landfill and household waste.[26]

The scope of illegal trade in hazardous waste is vast, and although it is near impossible to fully quantify the global situation, efforts have been made to understand the extent of the problem. Between 2004 and 2006 the Cluster for Transfrontier Shipments of Waste of the EU's Network for the Implementation and Enforcement of Environment Law (IMPEL-TFS) conducted inspections at major seaports within the EU. Of the shipments checked, 26% contained waste, of which 51% was deemed illegal. A significant amount of this illegal waste consisted of e-waste and end-of-life vehicles heading to Africa.[27] More recently between March-May 2009 the World Customs Organisation carried out inspections on shipments from Europe to Asia and Africa and seized more than 30,000 tonnes and 1,500 pieces of hazardous waste, 1,100 of which were heading to African countries.[28]

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[21] The Green Customs Initiative http://www.greencustoms.org/

[22] International Network for Environmental Compliance and Enforcement, The International Hazardous Waste Trade Through Seaports, 2009 http://www.inece.org/seaport/SeaportWorkingPaper_24November.pdf

[23] INECE, 2010, International Hazardous Waste Inspection Project At Seaports: Results And Recommendations http://inece.org/seaport/exercise/INECE_SeaportInspectionProjectOutcomes_22dec.pdf

[24] F. Adeola 'Environmental Injustice and Human Rights Abuse: The States, MNCs, and Repression of Minority Groups in the World System', 8/1 Human Ecology Review 39, 50 (2001) http://www.humanecologyreview.org/pastissues/her81/81adeola.pdf

[25] Andrews, A. Beyond the Ban - Can the Basel Convention adequately Safeguard the Interests of the World's Poor in the International Trade of Hazardous Waste? Law, Environ. Dev. J. 2009, 5 (2) 167– 185 http://www.lead-journal.org/content/09167.pdf

[26] The International Hazardous Waste Trade Through Seaports, Seaport Environmental Security Network, 2009, http://www.inece.org/seaport/SeaportWorkingPaper_24November.pdf

[27] Ibid

[28] World Customs Organization. Operation Demeter yields tons of illegal shipments of hazardous waste, 2009 http://www.wcoomd.org/press/default.aspx?lid=1&id=187.

Despite the introduction of the Basel Convention and regional counterparts such as the Bamako and Waigani Conventions, as well as international initiatives mentioned above, illegal trafficking and dumping of hazardous waste remains a serious global problem.

Information and Knowledge

One of the major challenges that must be addressed is that of information. As mentioned above there is a severe lack of reliable information available on hazardous wastes, including data on quantities, waste flows, and trade. Due to inadequate access to information developing countries often incorrectly assume they are capable of dealing with hazardous waste, and do not assess the risks properly. [29] Although the Basel Convention has helped improve the situation somewhat with the introduction of reporting requirements, inconsistent hazardous waste definitions and inadequate reporting mechanisms, particularly in developing countries, make it extremely difficult to assess the global situation. This only makes the challenge of enhancing the governance and management of hazardous waste even greater.

Financial and Technological Capacity

Financial and technological capacity of course plays a major part in the ability of countries to not only assess hazardous wastes, but also implement successful management strategies at the national and local levels. Hazardous waste poses many different challenges than non-hazardous waste and countries that have the necessary infrastructure to deal with the latter can struggle to cope with the collection, treatment and disposal requirements of the former. [3031]

Managing hazardous waste requires modern technologies, infrastructure and expertise, all of which require money. In developing countries waste is often managed in the informal sector, with slum dwellers collecting, sorting and recycling waste products of value. This poses huge health and environmental dangers, with exposure to toxic chemicals and heavy metals.[32] Technology transfer mechanisms and funding instruments are not sufficient enough to enhance the capacities of developing countries. With the Basel Convention requiring parties to install their own legal and enforcement strategies, but only providing limited technical and financial assistance, it is almost impossible for countries to enforce the requirements of the Convention.[33]

International Compliance

Hazardous waste management is a global issue and requires coherent international policy and cooperation at all levels to be successful. With the seemingly worsening situation in illegal trafficking and dumping, there is obviously a need to strengthen existing regulatory frameworks and improve implementation and enforcement of the Basel Convention in particular, which contains several weaknesses. For instance the Prior Informed Consent procedure does not provide any mechanism for assessing the capacity of the importing country to manage the waste it

[29] Andrews, A. Beyond the Ban - Can the Basel Convention adequately Safeguard the Interests of the World's Poor in the International Trade of Hazardous Waste? Law, Environ. Dev. J. 2009, 5 (2) 167– 185 http://www.lead-journal.org/content/09167.pdf

[30] Policy options and actions for expediting progress in implementation: Waste Management, CSD19, 2011 http://www.un.org/esa/dsd/csd/csd_pdfs/csd-19/sg-reports/CSD-19-SG-report-waste-management-final-single-spaced.pdf

[31] Policy options and actions for expediting progress in implementation: Waste Management, CSD19, 2011 http://www.un.org/esa/dsd/csd/csd_pdfs/csd-19/sg-reports/CSD-19-SG-report-waste-management-final-single-spaced.pdf

[32] Trends in Sustainable Development – Chemicals, Mining, Transport, Waste Management: 2010-2011, UNDESA http://www.un.org/esa/dsd/resources/res_publtrends_2010_topics.shtml

[33] Andrews, A. Beyond the Ban - Can the Basel Convention adequately Safeguard the Interests of the World's Poor in the International Trade of Hazardous Waste? Law, Environ. Dev. J. 2009, 5 (2) 167– 185 http://www.lead-journal.org/content/09167.pdf

receives in a safe and sustainable manner.[34] Political differences also mean the Basel Ban protocol and Liability policy are unlikely to ever come into force in their current form.[35]

Economics and Costs

The cost of safely storing, recycling and disposing of hazardous wastes is considerably higher than non-hazardous waste because of the increased risks it poses to health and the environment. Moreover with stricter environmental laws being introduced, particularly in developed countries, the costs of sound hazardous waste management are increasing. This has led to more developed countries resorting to the cheaper option of exporting their hazardous waste to developing countries, where legislation and enforcement is less robust. Developing countries are often more than happy to accept this waste as the short-term economic benefits far outstrip the risks that may be present.[36] The case of Guinea Bissau is probably the most extreme example of this practice. The small country in West Africa received an offer of $600 million from a US-European coalition of companies to accept a shipment of 15 million tons of toxic waste in the 1980s. This offer was nearly twice the country's GDP at the time[37]. Because of the economic incentives countries will often compete for contracts to import hazardous waste. The ship-breaking industry is the best of example of this with the likes of China, Bangladesh, India and Pakistan all competing for the right to dismantle ships that often contain hazardous materials including asbestos, PCBs and radioactive materials.[38][39]

Way Forward

E-waste and Extended Producer Responsibility

E-waste has become a serious global problem with widespread environmental and health consequences. Worldwide increasing volumes of e-waste must be stemmed by strengthening capacity at the national level and imposing tighter regulations on manufacturers of electrical equipment. Extended Producer Responsibility, whereby responsibility for the post-consumer stage of a product's life-cycle is shifted to the manufacturer[40], is an important concept that must be more widely incorporated into e-waste management, as well as broader national waste management strategies. This strategy provides an incentive for manufacturers to reduce the amount of potential waste in their products, improve the percentage of recyclable materials used and provide financial and technical assistance for collection and final disposal of their products. Legislation such as the EU's WEEE Directive has made some progress in this area, but there is still much room for improvement, particularly in enforcing the legislation. Those countries lacking the capacity to implement and enforce this type of strategy must be provided with the financial and technical assistance required.

International Legislation and Cooperation

International legislation relevant to hazardous waste must be strengthened, particularly in relation to illegal trafficking and dumping of waste which is of global concern. Enforcement of the Basel Convention must be improved and further efforts should be made to ratify the Ban Amendment

[34] Andrews, A. Beyond the Ban - Can the Basel Convention adequately Safeguard the Interests of the World's Poor in the International Trade of Hazardous Waste? Law, Environ. Dev. J. 2009, 5 (2) 167– 185 http://www.lead-journal.org/content/09167.pdf

[35] Ibid

[36] Ibid

[37] Preliminary draft report on illegal traffic in toxic and dangerous products, SAICM, 2010 http://www.saicm.org/documents/meeting/afreg/Abidjan%202010/Meeting%20docs/Afr3%20INF16_Illegal%20traffic.pdf

[38] Andrews, A. Beyond the Ban - Can the Basel Convention adequately Safeguard the Interests of the World's Poor in the International Trade of Hazardous Waste? Law, Environ. Dev. J. 2009, 5 (2) 167– 185 http://www.lead-journal.org/content/09167.pdf

[39] F. Pelsy (2008), 'The Blue Lady Case and the International Issue of Ship Dismantling', 4/2 Law, Environment and Development Journal 137, 139.

[40] OECD, Extended Producer Responsibility http://www.oecd.org/document/19/0,3746,en_2649_34281_35158227_1_1_1_1,00.html

and Protocol on Liability and Compensation, as well as improve the PIC procedure so that the capacity of countries importing hazardous waste can be properly assessed. Financial assistance and technology transfer should be improved to enable developing countries to enhance monitoring of hazardous waste and enforcement of relevant law, as well as building the capacity and infrastructure needed to safely manage waste. Information and knowledge transfer must also be improved at all levels to enable better understanding of the volumes, types and distribution of waste which will in turn enhance management strategies and governance.

Chapter 21: Environmentally Sound Management of Solid Wastes & Sewage-Related Issues

Introduction

In 1989 UN General Assembly resolution 44/228 stated that the environmentally sound management of wastes was one of the environmental issues "of major concern in maintaining the quality of the Earth's environment and especially in achieving environmentally sound and sustainable development in all countries"[1]. In response to this, Chapter 21 of Agenda 21 outlined a series of objectives and activities to promote the environmentally sound management of solid wastes.

Solid wastes, as defined in Agenda 21, include all domestic refuse and non-hazardous wastes such as commercial and institutional wastes, street sweepings and construction debris, and sometimes human wastes. Agenda 21 acknowledges the need for an integrated approach to solid waste management, which focuses on the following areas[2]:

- Minimizing wastes
- Maximizing environmentally sound waste reuse and recycling
- Promoting environmentally sound waste disposal and treatment
- Extending waste service coverage

Implementation

Minimizing wastes

Data on global waste production is often unreliable and in many cases is simply unavailable. Globally, municipal waste estimates tend to be more reliable than other forms of solid waste, as data can be gathered upon collection. The map below provides a snapshot of municipal waste collection globally, and highlights how strong the relationship is between economic growth and waste generation – the most developed countries and those rapidly developing (Brazil, China, and India) produce the largest volumes.[3]

It is this coupling of economic growth and waste that explains some of the trends seen over the past decades. In 2006, the total volume of global municipal solid waste was estimated to be around 2 billion tonnes, signifying a rise of 7 per cent per year since 2003. The report which presented this data also predicted an 8 per cent annual rate of increase from 2006 to 2011.[4] However there are major differences in growth figures between countries. Since 1980, municipal waste generated by OECD countries has increased to exceed 650 million tonnes in 2006, but in recent years overall production has started to stabilise, albeit at a high level. Since 2000, generation of municipal waste in Western European countries has stabilised at an average per capita rate of 560kg per year. The rapid growth in waste generation at the moment is occurring in developing countries, and this is predicted to continue; in Latin America and the Caribbean, for

[1]UN General Assembly A/RES/44/228, 85th Plenary Meeting, 1989 http://www.un.org/documents/ga/res/44/ares44-228.htm
[2]Agenda 21 Chapter 21: http://www.un.org/esa/dsd/agenda21/res_agenda21_21.shtml
[3]Trends in Sustainable Development – Chemicals, Mining, Transport, Waste Management: 2010-2011, UNDESA http://www.un.org/esa/dsd/resources/res_pubtrends_2010_topics.shtml
[4]Global Waste Management Market Report 2007

example, municipal waste is predicted to increase to 171 million tons in 2030, from a figure of 121 million tons in 2005[5].

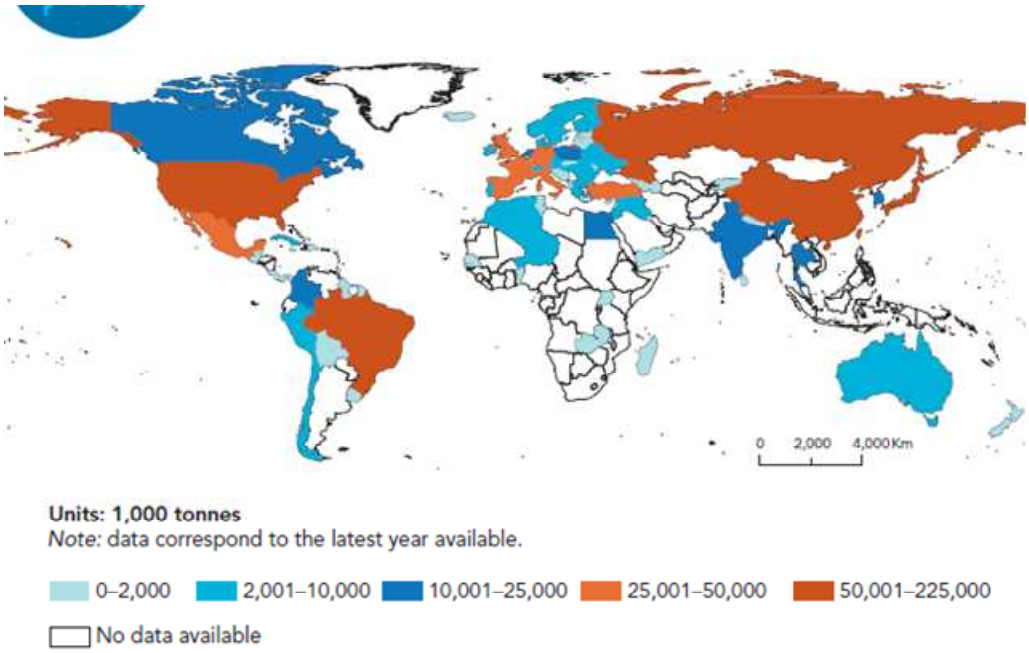

Figure 1: Global collection of solid waste
Source: UNDESA, 2010.

Despite the increasing global generation of solid waste, there has been progress in minimizing waste in some developed countries. Agenda 21 called for all industrialized countries, by the year 2000, to have in place programmes to stabilise or reduce the production of wastes destined for final disposal. Most countries primarily focussed on remediating the environmental impacts of landfill and incineration, however recently more policy measures are aimed at preventative strategies[6]. In the EU the revised Waste Framework Directive requires member states to establish national waste prevention programmes by December 2013[7]. The 2000 EC End of Life Vehicles Directive aimed to reduce the levels of hazardous waste in vehicles by shifting a portion of the responsibility for vehicle disposal to the producer. The Directive for Waste Electrical and Electronic Equipment (WEEE, 2002/96/EC) is another example that shifts the responsibility for end-of-life management of certain product categories from tax payer and municipalities to producers and consumers – both these examples are called *extended producer responsibility* and follow the *polluter pays principle*. Many member states have had waste prevention strategies in place for a number of years as part of wider integrated waste management programmes. In the UK the Courtauld Commitment has seen major retailers make significant reductions to the levels of food waste and packaging they produce. The Commitment, introduced in 2005, helped prevent 1.2 million tonnes of food and packaging waste in its first five-year phase[8] and successfully

[5]Trends in Sustainable Development – Chemicals, Mining, Transport, Waste Management: 2010-2011, UNDESA http://www.un.org/esa/dsd/resources/res_publtrends_2010_topics.shtml
[6]Gottbery et al. (2005) Producer responsibility, waste minimisation and the WEEE Directive: case studies in ecodesign from the European lighting sector. **Science of the Total Environment**. 359. 38-56
[7]EU Waste Legislation - http://ec.europa.eu/environment/waste/prevention/legislation.htm
[8] Waste & Resources Action Programme, Courtauld Commitment 1, http://www.wrap.org.uk/retail_supply_chain/voluntary_agreements/courtauld_commitment/phase_1/index.html

halted packaging waste growth in 2007.[9&10] Similarly, the Eco-Point Initiative in Italy[11] and Carbon Tax on Packaging in the Netherlands[12] are also addressing the issue of packaging waste. In Korea, the Volume Based Fee System introduced in 1995 requires households to dispose of any non-recyclable waste in pre-paid bags, while recyclable waste is collected for free. This waste reduction incentive scheme helped Korea reduce the amount of municipal solid waste it produces by about 16 per cent from 1994 to 2006.[13]

The US WasteCap programme established in 1998 helps businesses reduce the amount of waste they generate at source by providing a range of professional services including waste audits, management plans and technical support[14]. The US in general still relies heavily on landfill as the predominant waste management strategy; however, some states are increasing rates of recycling, energy-from-waste (EfW) and converting certain organic waste to biofuels. Recycling rates in the EU are considerably higher, partly driven by a 50 per cent by 2020 target, and EfW is more prevalent.

Maximizing environmentally sound waste reuse and recycling

Agenda 21 highlights the importance of strengthening national reuse and recycling systems. Developed countries have made significant progress in implementing recycling strategies. In the EU the rate of recycling and composting increased from 19 per cent to 38 per cent between 1998 and 2008, in part due to the Waste Framework Directive.[15] In 2005 the EU introduced a new strategy on the prevention and recycling of waste which sets minimum EU standards for recycling activities[16]. In the US around 9000 municipalities have introduced public collection of recyclables since the 1970s[17], while Japan has introduced a number of specific recycling laws on containers and packaging, construction materials and food that have helped promote recycling behaviour and establish Japan as a world leader in recycling.[18]

In developing countries recycling is generally an informal sector activity and as such it is difficult to obtain reliable data on recycling rates. The 2009 World Waste Survey suggests that between 1-2 per cent of urban populations in developing countries, over 15 million people worldwide are involved in informal segregation and re-use of waste.[19] Despite a lack of recycling infrastructure in these countries recycling rates are often still on par with developed cities and advances have been made. In Brazil, where there are estimated to be over half a million waste-pickers, the introduction of economic incentives for companies to recycle as well as cooperatives between companies and waste-pickers has helped increase recycling rates.[20]

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[9] The Courtauld Commitment http://ec.europa.eu/environment/waste/prevention/pdf/Courtauld_Commitment_Factsheet.pdf

[10] Government Review of Waste Policy in England 2011, http://www.defra.gov.uk/publications/files/pb13540-waste-policy-review110614.pdf

[11] Eco-Point Initiative http://ec.europa.eu/environment/waste/prevention/pdf/Ecopoint_crai_Factsheet.pdf

[12] Carbon Tax on Packaging http://ec.europa.eu/environment/waste/prevention/pdf/Netherlands_Factsheet.pdf

[13] Policy options and actions for expediting progress in implementation: Waste Management, CSD19, 2011 http://www.un.org/esa/dsd/csd/csd_pdfs/csd-19/sg-reports/CSD-19-SG-report-waste-management-final-single-spaced.pdf

[14] WasteCap (USA) http://ec.europa.eu/environment/waste/prevention/pdf/WasteCap_Factsheet.pdf

[15] Moving towards a recycling society, European commission http://bookshop.europa.eu/is-bin/INTERSHOP.enfinity/WFS/EU-Bookshop-Site/en_GB/-/EUR/ViewPDFFile-OpenPDFFile?FileName=KH7911102ENC_002.pdf&SKU=KH7911102ENC_PDF&CatalogueNumber=KH-79-11-102-EN-C

[16] Strategy on the prevention and recycling of waste, European commissionhttp://europa.eu/legislation_summaries/environment/waste_management/l28168_en.htm

[17] Review of implementation of Agenda 21 and the Johannesburg Plan of Implementation (JPOI): Waste Management, CSD 18, 2010http://daccess-ods.un.org/access.nsf/Get?Open&DS=E/CN.17/2010/6&Lang=E

[18] Trends in Sustainable Development – Chemicals, Mining, Transport, Waste Management: 2010-2011, UNDESA http://www.un.org/esa/dsd/resources/res_publtrends_2010_topics.shtml

[19] World Waste Survey 2009, http://www.veolia-environmentalservices.com/veolia/ressources/files/1/927,753,Abstract_2009_GB-1.pdf

[20] Policy options and actions for expediting progress in implementation: Waste Management, CSD19, 2011 http://www.un.org/esa/dsd/csd/csd_pdfs/csd-19/sg-reports/CSD-19-SG-report-waste-management-final-single-spaced.pdf

The 3Rs

Reuse and recycling is closely linked to waste reduction, and waste management strategies are increasingly incorporating an integrated 3Rs (Reduce, Reuse, Recycle) approach. The German government aims to achieve complete high-quality recovery of waste by 2020 and is in the process of implementing a closed-cycle management system for waste, which aims to eliminate waste being sent to landfill. It has introduced two legal instruments to assist in this - the Act for Promoting Closed Substance Cycle Waste Management and Ensuring Environmentally Compatible Waste Disposal and the Federal Emission Control Act. Both these instruments place a key role on Extended Producer Responsibility, making the producer of a waste product responsible for not only the initial manufacture of the product but also its subsequent use and disposal. It is therefore in the interest of the producer to design a product that contributes minimal waste and is reusable or recyclable.[21]The principle of Extended Producer Responsibility is gaining more prominence in waste policy with the 2008 revised EU Waste Framework Directive placing much greater emphasis on it to help strengthen the 3Rs in member states. The Directive establishes that developers, manufacturers and importers of products may be held responsible for the management of any waste that remains after a product is used, including any financial costs involved[22].

Other countries have also integrated the 3Rs approach into their national frameworks or are in the process of doing so. Japan was one of the first pioneers and introduced in 2000 the Fundamental Law for Establishing a Sound Material-Cycle Society which introduced targets for waste disposal and recycling rates. This law, along with the product-specific laws mentioned above contributed to Japan halving the amount of industrial solid waste for final disposal between 1989 and 2003, and reducing municipal solid waste by 67 per cent over the same period[23]. Japan played a key role in persuading the G8 countries to adopt the Kobe 3R Action Plan in May 2008 which aims to prioritise the 3Rs policies, establish an International Sound Material-Cycle Society and enhance collaboration and capacity development for 3Rs in developing countries.[24]

Promoting environmentally sound waste disposal and treatment

Agenda 21 called for the establishment of "waste treatment and disposal quality criteria, objectives and standards". In the EU several policy frameworks have been developed which fulfil this objective. The Waste Framework Directive requires all waste disposal companies to obtain a permit from a relevant authority which monitors the waste type, quantity and methods of waste treatment. There are also directives on landfill waste, incinerating waste and shipments of waste which set out standards to ensure the sound management of these activities.[25] There has been much progress in developed countries thanks to national targets on disposal. For instance Germany aims to achieve zero waste to landfill by 2020, and many cities around the world have adopted zero-waste targets, such as Los Angeles[26].

Incineration of solid waste and composting of organic waste have also become attractive options for many countries, although both options are expensive, and incineration in particular is extremely energy intensive, so large-scale use of these technologies is only financially sustainable

[21] Waste Management in Germany, General Information, 2010 http://www.bmu.de/english/waste_management/general_information/doc/4304.php

[22]EU, Revised Waste Framework Directive, 2008 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32008L0098:EN:NOT

[23]Asian Development Bank, Towards Resource-Efficient Economics in Asia and the Pacific: Reduce, Reuse, Recycle, 2008, Chapter 4: Developing National Policy Frameworks, http://www.adb.org/Documents/Papers/Resource-Efficient-Economies/Chapter-IV.pdf

[24]3R Initiative and Japan's International Cooperation towards Zero Waste, 2011, UNCRD http://www.uncrd.or.jp/env/spc/docs/Keynote per cent20MOE per cent20japan.pdf

[25]Waste Management, European Commission http://europa.eu/legislation_summaries/environment/waste_management/index_en.htm

[26]Review of implementation of Agenda 21 and the Johannesburg Plan of Implementation (JPOI): Waste Management, CSD 18, 2010http://daccess-ods.un.org/access.nsf/Get?Open&DS=E/CN.17/2010/6&Lang=E

in developed countries. Waste-to-energy plants have also gained more prominence recently and have been most widely promoted within the EU, [27] where there are around 420 waste-energy plants which can provide 32 million people with heat and a further 25 million with electricity[28].

Given the informal nature of waste disposal in developing countries and the lack of infrastructure and financial capacity available, environmentally sound disposal and treatment of waste is lacking in many developing countries. Landfill is usually the only option available and unplanned, informal landfill sites are often situated on wetlands or near water supplies creating environmental and health problems. Several countries have introduced landfill fees and have, or are in the process, of improving their landfill facilities but overall progress in slow. [29]

Extending waste service coverage

In many developing countries waste coverage remains extremely poor, with less than 50 per cent of urban areas often having no waste collection services. In some countries this figure can be as low as 5-10 per cent, and in rural areas can be zero.[30] With increasing urban populations and volumes of waste, the Agenda 21 target of providing waste coverage to all urban areas by 2025 looks increasingly unachievable.

Sewage-related issues

Wastewater and sewage management follows similar trends to general solid waste management – with collection and treatment infrastructure, as well as relevant legislation, being much more advanced in developed countries. In terms of global urban wastewater collection, the percentage of a population connected to such collection systems is lowest in Africa and Asia, with coverage often less than 30 per cent in countries where data is available. In comparison, Europe has the highest percentage, with many countries having 100 per cent of the population connected.[31] This is partly a result of the EU Urban Wastewater Treatment Directive, adopted in 1991 it required all member states to provide collecting systems for urban areas discharging to sensitive areas by 1998 and for all urban areas with more than 2,000 people by 2005, as well as ensure all waste-water is treated appropriately[32] – a specific objective mentioned in Agenda 21. Waste water management has not only made progress in developed countries, in Chile, as a result of a modern regulatory system implemented in the 1980s, followed by privatisation of water and sanitation in the 1990s, wastewater collection drastically improved, and now serves over 90 per cent of the urban population.[33]

Wastewater (and drinking water) treatment produces sludge from suspended solids. Sewage sludge quickly becomes putrescent as bacteria start to breakdown organic matter anaerobically (absence of Oxygen). Historically, countries with coastlines would simply transport sludge out to sea and dump it at depth. This resulted in 'dead-zones' in the marine environment and has been banned in the EU since 1988 and in the USA since 1991. These stringent regulations have generated a paradigm shift in many developed countries, seeing sludge as a useful resource rather than a nuisance waste product and enabling closed-loop waste disposal. Sludge is conditioned in

[27] Ibid
[28] Trends in Sustainable Development – Chemicals, Mining, Transport, Waste Management: 2010-2011, UNDESA http://www.un.org/esa/dsd/resources/res_pubtrends_2010_topics.shtml
[29] Review of implementation of Agenda 21 and the Johannesburg Plan of Implementation (JPOI): Waste Management, CSD 18, 2010http://daccess-ods.un.org/access.nsf/Get?Open&DS=E/CN.17/2010/6&Lang=E
[30] UNHABITAT, Solid Waste Management in the World's Cities, 2010
[31] Trends in Sustainable Development – Chemicals, Mining, Transport, Waste Management: 2010-2011, UNDESA http://www.un.org/esa/dsd/resources/res_pubtrends_2010_topics.shtml
[32] EU, Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31991L0271:EN:NOT
[33] Trends in Sustainable Development – Chemicals, Mining, Transport, Waste Management: 2010-2011, UNDESA http://www.un.org/esa/dsd/resources/res_pubtrends_2010_topics.shtml

anaerobic digesters to remove any pathogens and produces methane which can be harnessed to power the treatment plant and in some circumstances enable treatment plants to become net energy generators. The conditioned sludge is then dried and can be used as a soil conditioner in agriculture or domestic composting and in high-tech low emission incineration. Developing countries are also seeing informal sludge treatment enterprises develop. Entrepreneurs and NGOs in West Africa are currently working on attracting investment towards integrated sanitation approaches that are increasingly viable business prospects[34].

International Legislation

There remains a lack of international policy and regulation relating directly to solid waste management. Waste is addressed through the Basel Convention and Bamako Convention but these are specific to movements of hazardous waste (see the previous Chapter). There is the 1972 London Convention and subsequent 1996 London Protocol which addresses the dumping of waste in the marine environment. The Protocol - which entered into force in 2006 - prohibits all dumping of waste except for some accepted wastes, which include the likes of dredged material, sewage sludge and organic material. Guidelines, technical assistance and capacity development are provided under the Convention and its Protocol[35].

More recently at the UNEP Governing Council session in February 2011 a Global Partnership on Waste Management (GPWM) was established, which aims to tackle the adverse effects of unsound waste management, promote resource efficiency through waste prevention and enhance international cooperation, knowledge management and sharing. The GPWM will provide support for implementing integrated solid waste management, as well as the 3Rs principles and general waste prevention but it is still in its early stages, with the operational structure and Terms of Reference still being formulated, as of April 2011[36].

Challenges and Conflicts

Global solid waste continues to increase in volume and waste streams are becoming increasingly diversified. The challenges in managing this waste safely and sustainably are significant. In developing countries experiencing rapidly expanding populations, urbanisation and economic growth, the problems of increasing waste are often unmanageable.

Financial Capacity

Developing countries spend approximately 60 to 70 percent of their waste budget just on collection and it is estimated that complete municipal solid waste management can amount to 1-2 per cent of a country's entire GDP. With increasing amounts of waste, government spending on waste management has also expanded. China has recently reported that it plans to spend about US$126 billion on new infrastructure and provisions for municipal solid waste[37]. Increasingly important is the adoption of modern waste management technologies to deal with increasing volumes of waste, but these are expensive and therefore not available to the majority of poorer nations. Public private partnerships (PPPs) have proved useful in overcoming prohibitive upfront costs associated with waste management in several countries – in the UK, USA and Canada waste service costs have been reduced by 25 per cent by working with the private sector. PPPs could

[34] Waste enterprisers (2010) Accessed at: http://www.waste-enterprisers.com/

[35] The London Convention and Protocol: their role and contribution to protection of the marine environment, IMO brochure, 2008 http://www5.imo.org/SharePoint/blastDataHelper.asp/data_id per cent3D21278/LC-LPbrochure.pdf

[36] UNEP GPWM, 2011 http://www.unep.or.jp/ietc/SPC/activities/GPWM/activity_global-partnership.asp

[37] Policy options and actions for expediting progress in implementation: Waste Management, CSD19, 2011 http://www.un.org/esa/dsd/csd/csd_pdfs/csd-19/sg-reports/CSD-19-SG-report-waste-management-final-single-spaced.pdf

thus be one option for reducing costs, but clearly developing countries must be provided with more financial assistance to deal with waste[38].

Information and Data Management

Data is crucial to enhancing sustainable waste management. It enables accurate monitoring of the waste situation in different countries, and thus plays a key role in developing specific management strategies and monitoring the success of these over time. Yet obtaining reliable data and information regarding waste generation, collection, type, and disposal is a major challenge. There is general lack of consistency worldwide in waste definitions as well as reporting methods. Developing countries especially often lack the technical, financial as well as institutional capacity to implement effective monitoring and data collection. At the international level, in addition to improving the global consistency in data reporting, there also needs to be improved means for information exchange. At the moment there is no mechanism in place that facilitates this[39].

Technical Capacity and Infrastructure

The application of modern technologies has played an important role in improving waste management in developed countries and in helping these countries implement a 3R approach to management. However in developing countries even basic infrastructure is often inadequate – in rural areas in particular waste infrastructure is often non-existent. This is mirrored in the sanitation sector where wastewater treatment sites are often already overburdened and unable to cope with additional pressures. This results in untreated sewage being discharged directly to local watercourses and, if separated, sewage sludge disposed of in inadequately contained landfill sites or at sea. Current mechanisms for technology transfer between countries are poor, and must be improved so that poorer countries are better equipped to manage their waste[40].

Education and Awareness-raising

In many countries there is a lack of basic understanding of the environmental and health dangers of improper waste disposal. Education and training are needed in order to promote positive behaviours at the local level, and improve waste prevention, reduction and environmentally sound disposal, but many poorer countries lack the institutional and financial capacity to provide this education.

Legislation and policy frameworks

Broad international policy on solid waste management is lacking, and many countries do not place waste management as a priority. As such national policy frameworks are often inadequate and are not capable of dealing with the complexities and changing aspects of waste management. Establishing effective legislation is not just an issue in developing countries however, with the EU having struggled to introduce effective policies for minimizing waste. The EU's 2005 Thematic Strategy on the prevention and recycling of waste stated that despite waste prevention being a key objective of EU and national policy for a number of years, there had been little progress in transforming it into practical action[41]. The newly revised Waste Framework Directive seeks to rectify this by focussing on implementing *extended producer responsibility*[42] in addition to waste prevention policy frameworks that are currently seen as insufficient.[43] The WEEE Directive was successful in shifting responsibility for end-of-life disposal of products from the

[38] Ibid
[39] Ibid
[40] Ibid
[41] EU, Waste Prevention http://ec.europa.eu/environment/waste/prevention/index.htm
[42] EU, Revised Waste Framework Directive, 2008 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32008L0098:EN:NOT
[43] Review of implementation of Agenda 21 and the Johannesburg Plan of Implementation (JPOI): Waste Management, CSD 18, 2010http://daccess-ods.un.org/access.nsf/Get?Open&DS=E/CN.17/2010/6&Lang=E

tax payer to the producer and/or consumer. However, the charges for disposal were too small so that the short-term costs were passed onto the consumer in a relatively inelastic market; consequently it did not reduce the use of hazardous materials in products or stimulate more innovative ecodesign[44].

Way Forward

The 3Rs

Solid waste is complex and there is no easy solution to manage it, particularly with increasing volumes of waste and diversifying waste streams. An integrated approach to waste management, focussing on the 3Rs, has been shown to be effective but must now be implemented more widely. Recycling, in particular, has advanced significantly since 1992, and the focus must now be on reduction and prevention of waste at source to decrease global waste production. To advance waste reduction strategies, producer responsibility should be applied whereby the producer bears responsibility for their products along their entire life-cycle which incentivises producers to reduce waste at source, rethink packaging design and production processes and promotes more environmentally friendly process design. Strategies established in Germany and Japan are examples of best practice for introducing the 3Rs and extending producer responsibility into waste management systems. Incorporating these types of principles and market-based regulations is an integral part of the transition to a Green Economy as it internalises the external environmental costs of products and should be reflected in national and international frameworks.

Policy

Solid waste management policy must be improved at all levels and implementation strengthened, particularly in developing countries experiencing rapid urbanisation and population growth. Waste reduction and prevention policies in particular must be enhanced along-side continuing progress in recycling and disposal, to support the 3Rs principles. Waste-energy recovery is becoming an attractive option but must be supported by an appropriate policy framework that emphasises the importance of waste as a resource. At the global level there is a lack of any over arching policy framework on waste management. The Basel and Bamako Conventions do address the important issue of transboundary movements of hazardous waste, and the London Convention does deal with dumping of waste at sea. However, there remains a lack of political guidance at the international level with regards to implementing integrated solid waste management strategies and the 3Rs. The formation of the GPWM may fulfil this need, but given the importance of sound waste management in achieving sustainable development, an international treaty or convention on waste should also be considered, to provide stronger political momentum and accelerate technology transfer to developing countries.[45]

At the national level, it is fundamental that Governments lead by example and reshape public sector procurement policies to ban any purchasing of hazardous substances, make product declarations and exert pressure on unsustainable supply chains as an effective motivator of more sustainable product design and production processes. Regulations that focus more on *extended producer responsibility* for products, must get the balance right where charges for disposal are high enough to incentivise producers to reduce the use of hazardous materials in their products and to stimulate more eco-design rather than simply passing the costs of waste management onto the consumer.

[44]Gottbery et al. (2005) Producer responsibility, waste minimisation and the WEEE Directive: case studies in ecodesign from the European lighting sector. Science of the Total Environment. 359. 38-56

[45]Gary D. Meyers, (2006) An international waste convention: measures for achieving sustainable development, http://wmr.sagepub.com/content/24/6/505.abstract

Capacity-Building and International Collaboration

Successful waste management strategies require not only a robust policy framework but also adequate financial, technological and institutional capacity. Developing countries in particular often lack much of this capacity, so it is crucial that capacity building programmes are implemented where needed. International collaboration must be improved so that countries are provided with better access to technology, training and funding instruments.

Chapter 22: Promoting the safe and environmentally sound management of radioactive wastes

Introduction

Radioactive wastes can be generated as part of the nuclear fuel cycle and from the application of nuclear technologies in medicine, industry and research. Nearly all countries produce some radioactive waste due to these latter nuclear applications[1]. However the vast majority of global radioactive waste comes from the nuclear power process, and as it is generally only developed countries that can afford the exorbitant costs involved in generating nuclear power, they are the main producers of radioactive waste[2]. The characteristics and associated risks from radioactive waste vary considerably, from low-level waste which is short-lived and low risk to high-level waste, which includes spent nuclear fuel, and poses considerable health and environmental risk due to its high radiation levels and lifespan of tens of thousands of years or more. Although low-level waste comprises around 90% of the total global volume of radioactive waste it is high-level waste that contains 99% of total global radioactivity, and therefore requires much more careful management.

Agenda 21 noted the increasing volumes of radioactive waste worldwide and, given the substantial risks associated with it, recognised that the safe and environmentally sound management of radioactive waste was of paramount importance to achieving sustainable development targets. This chapter sets out an overall objective of "ensuring that radioactive wastes are safely managed, transported, stored and disposed of, with a view to protecting human health and the environment".[3]

Implementation

International Progress

At an international level the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management is the first and only legislative framework addressing these issues and the objective of this chapter. The Joint Convention, adopted in 1997, is managed by the International Atomic Energy Agency (IAEA) and came into force in 2001[4]. As of June 2011 there are 60 Contracting Parties to the Convention[5]. The objectives of the Joint Convention include achieving and maintaining a high level of safety worldwide in spent fuel and radioactive waste management, through the enhancement of national measures and international cooperation. Contracting Parties are obliged to establish and maintain national regulatory frameworks to ensure safe management of radioactive waste, as well as protect people and the environment from any adverse radiological hazards by constructing and operating nuclear facilities appropriately. The Convention also imposes regulations on transboundary movements of waste based on the concepts found in the IAEA Code of Practice on the International Transboundary Movement of Radioactive Waste – this was a key aim listed in Agenda 21[6]. To ensure progress is made in implementing the Convention, review meetings take place every three

1 Policy options and actions for expediting progress in implementation: Waste Management, CSD19, 2011 http://www.un.org/esa/dsd/csd/csd_pdfs/csd-19/sg-reports/CSD-19-SG-report-waste-management-final-single-spaced.pdf
2 Review of implementation of Agenda 21 and the Johannesburg Plan of Implementation (JPOI): Waste Management, CSD 18, 2010http://daccess-ods.un.org/access.nsf/Get?Open&DS=E/CN.17/2010/6&Lang=E
3 Agenda 21 Chapter 22 http://www.un.org/esa/dsd/agenda21/res_agenda21_22.shtml
4 Joint Convention, IAEA http://www-ns.iaea.org/conventions/waste-jointconvention.asp
5 Joint Convention Status, IAEA, 2011 http://www.iaea.org/Publications/Documents/Conventions/jointconv_status.pdf
6 Joint Convention Background http://www-ns.iaea.org/conventions/jointconv-background.asp

years and Parties are required to submit national progress reports as part of this process. With about 95% of all radioactive waste worldwide being managed by Parties to the Joint Convention, it plays a key role in ensuring the safe management of waste at the global level.[7]

The IAEA also publishes Safety Standards and Guides on all aspects of nuclear activity including the safe disposal and transport of radioactive wastes. It helps its Members implement these standards by providing education and training services, as well as conducting safety reviews and appraisals. According to the IAEA's Radioactive Waste Management Database, which compiles data from national reports, 62% of countries in 2008 had implemented a national policy for radioactive waste management, while 32% had partially implemented a national policy. However, only 34 countries produced national reports for the database, so this is not necessarily representative of the global situation.[8]

Soon after Agenda 21 was published another key aim of Chapter 22 was achieved: The 1972 London Dumping Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter adopted an amendment in 1993 which banned the disposal of radioactive waste at sea. The amendment came into force in 1994 and two years later Parties to the Convention adopted the 1996 Protocol which requires that a precautionary approach is taken to waste disposal at sea, as requested in Agenda 21.[9]

Regional and National Progress

The EU recently proposed a directive which sets out safety standards for managing radioactive waste and spent fuel. These standards are based on those of the IAEA, but will be legally binding and enforceable within EU Member States when the directive comes into force in 2011.[10] The Directive will also require all Members to establish national programmes for the safe management and disposal of radioactive waste, regardless of their stance on nuclear, as radioactive waste is an issue for all States, given the range of nuclear applications outside of nuclear power.[11] Finally the Directive will ban export of waste outside of the EU.

The OECD Nuclear Energy Agency (NEA) has a Radioactive Waste Management Committee that works closely with the IAEA and NEA members to enhance collaboration, information sharing and best practice techniques to improve long-term waste management.[12]

Challenges and Conflicts

High-level waste disposal

The major challenge facing radioactive waste management is disposal. Established infrastructure is widely implemented for the storage and disposal of low-level radioactive waste and for the storage of high-level waste and spent nuclear fuel. However there are currently no practices in place with which to dispose of high-level waste and spent nuclear fuel. The general consensus is that deep geological disposal is the best option for high-level waste, and underground facilities

7 Policy options and actions for expediting progress in implementation: Waste Management, CSD19, 2011 http://www.un.org/esa/dsd/csd/csd_pdfs/csd-19/sg-reports/CSD-19-SG-report-waste-management-final-single-spaced.pdf

8 IAEA NEWMDB http://nucleus.iaea.org/sso/NUCLEUS.html?exturl=http://newmdb.iaea.org/

9 London Dumping Convention http://www.imo.org/About/Conventions/ListOfConventions/Pages/Convention-on-the-Prevention-of-Marine-Pollution-by-Dumping-of-Wastes-and-Other-Matter.aspx

10 EU Questions & Answers: Nuclear Waste Disposal http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/10/540&format=HTML&aged=0&language=en&guiLanguage=en

11 EU Nuclear Waste Management http://ec.europa.eu/energy/nuclear/waste_management/waste_management_en.htm

12 OECD-NEA Radioactive Waste Management http://www.oecd-nea.org/rwm/

are currently in the planning process[13]. Finland plans to have a deep-geological repository up and running in 2020, Sweden in 2023 and France in 2025[14] and the IAEA, OECD and EU already have in place accepted safety standards for the management of repositories[15].

But there has been plenty of political controversy around where these facilities should be located due to a lack of public acceptance in many areas. In 2010 plans to build a repository in Yucca Mountain, Nevada in the USA were shelved due to political and social opposition[16]. In addition - despite the decades of research that has gone into developing deep-geological disposal as a solution - there are still many uncertainties surrounding the practice, particularly the long-term processes and effects that will occur in these repositories given the length of time that high-level waste will have to be contained. However, a 2009 report by the EU's Joint Research Centre does state that research and development has reached a mature enough level to proceed with the first stages of implementation. The main challenge is in ensuring stakeholders are involved in decision-making processes and improving public support and understanding of this new waste management technique. The EU has noted that deep-geological disposal is a very technically advanced and expensive process though, and as such some countries, most notably newer members of the EU, may lack the technical and financial capacity to implement waste management strategies involving the practice.[17]

Legacy Waste

Legacy waste is radioactive waste attributable to some of the first nuclear activities that took place around the world. Several countries, including the UK, USA, Russia and France have several sites contaminated with wastes that were produced when these countries were establishing the first nuclear power plants.[18] In the UK, the costs of dealing with these wastes were estimated in 2009/10 to be £45.1 billion by the Nuclear Decommissioning Authority (NDA). These high costs are attributed to the lack of awareness in the past to the importance of planning for future nuclear decommission. The challenge of decommissioning and remediating these sites in the UK is vast, with the NDA stating that it "represents the largest, most important environmental restoration programme in Europe".[19]

In addition to legacy waste on land there are numerous marine sites around the world where nuclear waste has been dumped without any care for the environmental and health consequences. This was often common practice before international regulation, such as the London Convention, came into force, with the UK, France and USA all disposing their nuclear waste at sea. Arguably the most notable example of this practice however was Russia's disposal of nuclear waste during the Cold War. According to a 1993 report submitted to the London Convention, the former Soviet Union dumped over 17,000 containers of solid and liquid radioactive waste, as well 16 nuclear reactors (6 of which still contained fuel), into several Seas of the Arctic Ocean.[20] Although

13Review of implementation of Agenda 21 and the Johannesburg Plan of Implementation (JPOI): Waste Management, CSD 18, 2010http://daccess-ods.un.org/access.nsf/Get?Open&DS=E/CN.17/2010/6&Lang=E

14 EU Questions & Answers: Nuclear Waste Disposal http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/10/540&format=HTML&aged=0&language=en&guiLanguage=en

15 Geological Disposal of Radioactive Waste: Safety Requirements, IAEA Safety Standards Series http://www-pub.iaea.org/MTCD/publications/PDF/Pub1231_web.pdf

16 Nuclear Waste: Disposal Challenges and Lessons Learned from Yucca Mountain, 2011 http://www.gao.gov/products/GAO-11-731T

17 Geological Disposal of Radioactive Waste: Moving Towards Implementation, European Commission JRC, 2009 http://ec.europa.eu/dgs/jrc/downloads/jrc_reference_report_2009_10_geol_disposal.pdf

18World Nuclear Association, Radioactive Waste Management http://www.world-nuclear.org/info/inf04.html

19 Nuclear Decommissioning Authority: Strategy Effective from April 2011 http://www.nda.gov.uk/loader.cfm?csModule=security/getfile&pageid=44503

20 Nyman, J. (2002) The Dirtiness of the Cold War: Russia's Nuclear Waste in the Arctic, Environmental Policy And Law, 32/1 http://iospress.metapress.com/content/d68bxfvh3x1a15n8/fulltext.pdf

assessments carried out so far have not found radiation levels to be dangerously high, the containers will eventually corrode and release their contents into the ocean posing huge environmental and health risks. In addition much of the waste has still not been located or accounted for.[21]

International Cooperation

Despite the management of radioactive waste being a global issue, it is predominantly developed countries that are involved in international collaboration around the issue of waste. The IAEA has 151 members yet only 60 are Parties to the Joint Convention on Safe Radioactive Waste Management[22]. In order to strengthen international collaboration and regulation it is important that more countries sign the convention. Even if countries do not have a nuclear programme, the Convention plays an important role in providing advice and expertise to those considering nuclear power and helps countries strengthen their national frameworks for waste management.

There are several countries that have nuclear power plants, yet are not signed up to the Joint Convention, including Mexico, Pakistan, India and South Korea.[2324] In addition the IAEA reported in 2010 that 65 countries were considering, or actively planning to introduce nuclear power, with 25 of these targeting their first plants to be operational before 2030.[25] A significant number of these countries are also yet to sign the Joint Convention. With increasing nuclear activity comes increasing volumes of nuclear waste, and without a strong overarching global framework covering all worldwide nuclear waste, regulating and enforcing sound waste management in countries will become increasingly difficult.

Although the international policy frameworks dealing with nuclear waste are extremely important they do also have their flaws which should be addressed. In the Joint Convention, for example, there is currently no non-compliance procedure in place which makes it difficult to enforce some of its requirements. Similarly, the London Convention contains no provisions for liability and responsibility for dumping. So despite Russia's dumping of waste in the Arctic Ocean, which directly violates the convention, there is no mechanism for punishment or for exacting compensation.[26] In addition the internationally agreed Safety Standards produced by the IAEA are not legally binding so there is no requirement for countries to implement these Standards into their national frameworks. It is this lack of international enforcement that is part of the reason that the EU is introducing its new Directive mentioned above.[27]

Data and Information

Data and information management is vitally important for understanding the global nuclear waste situation and for facilitating information sharing and reporting. The IAEA's Radioactive Waste Management Database is an important tool enabling this information management, but national data is often missing or unreported.[28] This needs to be improved, possibly by introducing a non-compliance strategy, or providing enhanced reporting tools and expertise.

21Ibid

22IAEA http://www.iaea.org/

23World Nuclear Power Reactors & Uranium Requirements, World Nuclear Association.2010, http://www.world-nuclear.org/info/reactors.html

24 Joint Convention Status, IAEA, 2011 http://www.iaea.org/Publications/Documents/Conventions/jointconv_status.pdf

25 IAEA, 2010, International Status and Prospects of Nuclear Power http://www.iaea.org/About/Policy/GC/GC54/GC54InfDocuments/English/gc54inf-5_en.pdf

26 Nyman, J. (2002) The Dirtiness of the Cold War: Russia's Nuclear Waste in the Arctic, Environmental Policy And Law, 32/1 http://iospress.metapress.com/content/d68bxfvh3x1a15n8/fulltext.pdf

27 European Commission, Council Directive on the management of spent fuel and radioactive waste, 2010 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52010PC0618:EN:HTML:NOT

28 IAEA NEWMDB http://nucleus.iaea.org/sso/NUCLEUS.html?exturl=http://newmdb.iaea.org/

Shipments of Radioactive Waste

Despite improved regulation on the transboundary movement of nuclear waste, which includes provisions to minimize its impact, there continues to be strong public opposition to shipments of nuclear waste, and this can often result in waste being returned or halted due to public campaigns. Irrespective of the fact that these campaigns are sometimes short-sighted – as they only prevent waste storage in a particular area and do not get rid of the problem of waste – they present a potential obstacle in efforts to develop even the best managed and low-risk nuclear waste disposal system.[29]

Illegal Dumping

Despite extensive legislation illegal dumping of nuclear wastes does still take place. Off the coast of Somalia for example, there have been reports of European ships dumping barrels of nuclear waste since the fall of the government in 1991. After the 2005 tsunami struck south-east Asia, hundreds of leaking barrels of radioactive waste washed up on shore, causing outbreaks of radiation sickness and hundreds of deaths.[30] Monitoring and enforcement of illegal dumping poses huge challenges and there are surely countless more examples of illegal dumping that go unreported.

National Strategies

Although there has been much progress, many countries are still yet to implement adequate national policy frameworks and strategies for managing radioactive waste, particularly disposal of waste. As mentioned earlier there is often a significant knowledge gap between countries with established nuclear power programmes and those who are relatively new to the process, and as such this can affect efforts to create a strong and comprehensive national strategy. Finance is also an issue with many countries not able to commit funds to the long-term management of radioactive waste and future decommissioning of nuclear power plants, during the early stages of developing a nuclear programme.[31] The importance of promoting transparency and involving communities and stakeholders in the planning stages of new radioactive waste facilities has become very apparent in recent years. It is vital that stakeholder engagement strategies are developed and implemented as part of all national strategies to ensure the successful implementation of safe radioactive waste management. [32]

Way Forward

The management of radioactive waste requires long-term strategies that are incomparable to any other type of waste management. Because of the length of time involved, as well as the health and environmental risks associated with radioactive waste, it is imperative that countries have the institutional, financial and technical capacities in place to safely store, transport and dispose of radioactive waste. Any nuclear-related activities are highly controversial, so it is important to engage with stakeholders and raise public awareness when planning waste storage and disposal facilities. The disposal of high-level waste poses the biggest challenge, and although geological disposal is currently seen as the most suitable strategy, research and development must continue so that new management solutions can be provided. At the global level, the Joint Convention and

29 GreenPeace, 2010, Public pressure stops French nuclear waste export to Russia http://www.greenpeace.org/international/en/news/features/Public-pressure-stops-French-nuclear-waste-export-to-Russia/

30 Hari, J. (2009) http://www.independent.co.uk/opinion/commentators/johann-hari/johann-hari-you-are-being-lied-to-about-pirates-1225817.html

31 IAEA Joint Convention Third Review Meeting Report, 2009 http://www-ns.iaea.org/downloads/rw/conventions/third-review-meeting/final-report-english.pdf

32 Nuclear Waste: Disposal Challenges and Lessons Learned from Yucca Mountain, 2011 http://www.gao.gov/products/GAO-11-731T

IAEA safety regulations and enforcement strategies must be strengthened, similar to the proposed EU Directive, to enhance the global governance of radioactive waste. Non-compliance procedures should be considered to improve implementation and enforcement of legislation at the national level. In addition more countries should be persuaded to sign and ratify the Convention. With the application of new nuclear technologies and more countries starting to pursue nuclear power as an energy option, it is vital that provisions are put in place right from the start for the long-term management of radioactive waste.

Section 3: Strengthening the Role of Major Groups

Chapter 23: Preamble

Introduction

UNCED recognized that actors beyond nation-states shape global realities. For sustainable development to become a reality, passive victims as well as conscious and unconscious destroyers of the planet need empowerment and support to get involved in reversing negative trends and creating positive alternatives. Agenda 21 included a full section on how governments and international organizations could strengthen the role of major groups in society to be part of the solution, instead of being part of the problem. The section is also a recognition of the valuable role civil society actors and other stakeholders had already played, and an admission that governments and intergovernmental organizations will not be successful in their endeavors to implement Agenda 21 without trusting Major Groups to take the lead in their respective areas.

Chapter 23, the Preamble for Agenda 21 Section III on Strengthening the Role of Major Groups, is a brief chapter with four paragraphs providing a general framework for the rest of the chapters in the section. There are no "Activities" in the Preamble, but two broad objectives emphasize that (i) Agenda 21 implementation requires broad public participation in decision-making, and (ii) there is a need for new forms of participation as a prerequisite for sustainable development. The objectives are addressed to governance for sustainable development on both international and national levels.

The UN Charter formally recognizes three categories of participants in the Organization: (i) representatives of nations, (ii) representatives of international organisations, and (iii) representatives from accredited non-governmental organisations (NGOs).[1]The involvement of non-state actors in international governance was therefore not a new phenomenon, but all UN agencies had ties to NGOs working with issues directly relevant to their mandates. There is no universally agreed standard definition of an NGO, which means it is subjected to interpretation. Agenda 21 Chapter 23 expands the meaning of legitimate actors by stating "Any policies, definitions or rules affecting access to and participation by non-governmental organizations in the work of United Nations institutions or agencies associated with the implementation of Agenda 21 must apply equally to all major groups."[2] The subsequent chapters in Section III identify nine Major Groups that should all be involved: Women, Children and Youth, Indigenous People, Non-governmental Organizations, Local Authorities, Workers and Trade Unions, Business and Industry, Scientific and Technological Communities, and Farmers. Agenda 21 and the global momentum for sustainable development called for stakeholder participation to a broader extent than the world had ever before experienced.

A useful academic model for assessing the nature and degree of citizen participation in decision-making was developed in the 1960's by Dr. Sherry Arnstein. He identified a typology of eight levels of participation, where the two lowest should be seen as non-participation, and the remaining six as participation with increasing degrees of decision-making clout for the public.[3]

[1]UN Charter
[2]Agenda 21 Paragraph 23.3
[3]http://lithgow-schmidt.dk/sherry-arnstein/ladder-of-citizen-participation.html

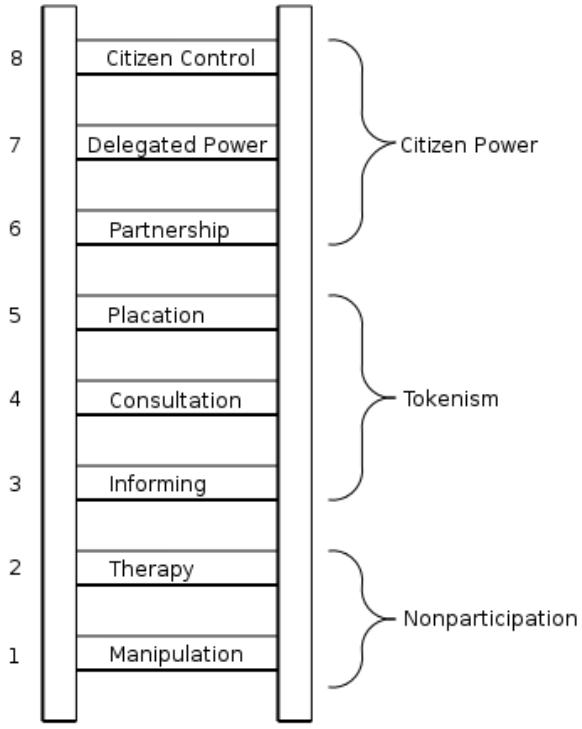

Figure 1. Ladder of Participation
Source: Arnstein, Sherry R. "A Ladder of Citizen Participation," JAIP, Vol. 35, No. 4, July 1969:216-224.

Prior to UNCED, most of the involvement of non-state actors in international governance was limited to informing and consultation, and in a few cases placation, which are found on rungs 3-5 on the "Ladder of Participation". After UNCED, ad-hoc consultations on specific occasions were no longer seen as enough in governance for sustainable development, but an unprecedented spirit of mutual partnership emerged between governments, intergovernmental bodies and major groups. There was a need to create new opportunities for major groups to participate in all steps of governance, from defining problems, setting priorities, making decisions, designing programmes, implementing projects, and evaluating activities. It was widely recognized that implementation of the ambitious global agenda would require involvement of multiple actors with a broad range of perspectives and expanded numbers on all levels of governance.[4] It is important that all stakeholders perceive governance as credible, stable, inclusive and legitimate, and its actions and representatives must be accountable to their constituencies.[5]

[4] http://www.un.org/documents/ecosoc/cn17/1994/background/ecn171994-bpch23-32.htm
[5] Biermann (2007). 'Earth system governance' as a crosscutting theme of global change research. Global Environmental Change 17 (2007) 326–337.

Implementation

International implementation

Growing numbers of actors beyond nation-states

The Agenda 21objective of broad public participation in decision-making is generally regarded as being very successful in terms of numbers of actors involved on the international arena. The quantity of non-state actors engaged in UN summits and processes has grown tremendously since the adoption of Agenda 21. For example, while UNCED had approximately 2,400 non-state actors accredited to the official conference, this number increased to a little over 8,000 representatives from slightly under 1,000 different organizations accredited to the official WSSD in Johannesburg in 2002.

The number of NGOs in formal consultative status with the UN has also been steadily growing. The highest authority dealing with NGO inclusion in the UN system is the Economic and Social Council (ECOSOC), with which all participating non-state actors need to have a recognized and established relationship according to UN formalities. On 1 September 2010, the ECOSOC had 139 organizations in general consultative status, 2,218 in special consultative status, and 1,025 on the Roster.[6] Specialized agencies and UN programmes may choose to develop their own accreditation processes, as long as they do not violate the basic principles set down in the Charter. Inspired by what took place in Rio, many UN bodies with the support of governments made it easier for more actors to get involved in their work, and numbers have been growing constantly there as well. It became possible for multiple actors to access arenas earlier seen as the exclusive rights of governments, and the UN accredited NGO membership literally exploded upon the world.

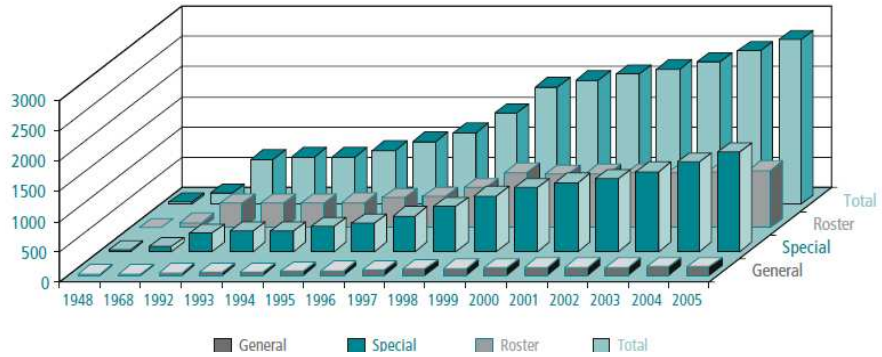

Figure 2. NGOs in consultative status since 1948, by category
Source: Negotiating and Implementing MEAs: A Manual for NGOs, p. 30.

Increased diversity of stakeholders

Agenda 21's establishment of the concept of nine Major Groups has increased the diversity of actors involved in many UN processes. In order to not go against the Charter, the inclusion of all Major Groups in the UN system needs to be engineered through organizational NGO constructs. There were already many NGOs for women, youth, farmers, and indigenous peoples, as well as cross-sectoral non-governmental organizations that could fit into the NGO Major Group. The

[6]ECOSOC (2010). List of non-governmental organizations in consultative status with the Economic and Social Council as of 1 September 2010. E/2010/INF/4

remaining Major Groups (trade unions, science and technology, business and industry, and local authorities) cannot be considered NGOs, but in light of UNCED they set up their own international NGOs to work through in the UN interface.

The Commission on Sustainable Development and the United Nations Environment Programme are the only UN bodies that have fully applied the concept of Nine Major Groups as the organizational model for inclusion of actors beyond member states. However, many other international institutions organize their public participation as systems of 'NGO constituencies', in which the classification categories may be environmental/public interest NGOs, business NGOs, scientific observers, etc., instead of Major Groups. Agenda 21 inspired a large number of organizations and Governments on all spatial levels to look beyond their usual allies and seek input from additional groups. It is widely recognized that the sustainable development agenda needs participation to be as broad and diverse as possible, since all groups have important values and perspectives to bring.

Moreover, the non-state actors involved throughout the UN system before the 1990's had been mostly northern-based international NGOs with formal structures and manners.[7] Since UNCED, more efforts have been made to reach out to less formal groups, grassroots and social movements, as well as actively enabling increased participation from the South through funding and capacity-building.

Application of the 9 Major Groups model in CSD

The most profound development of the Major Groups concept has taken place within the purview of the Commission on Sustainable Development (CSD), which was created as an outcome of UNCED and charged with monitoring and overseeing implementation of Agenda 21.

The model for involving Major Groups during CSD sessions has evolved over time in an experimental manner. In the 1990's, all non-state actors who participated in CSD sessions formed a broad and diverse field of self-organizing caucuses, both regional and issue-focused, in which people from different Major Groups and stakeholders participated, exchanged views and worked together on particular policy priorities. Some coordination efforts were introduced and tried out, such as Northern and Southern steering committees.

AfterJohannesburg and CSD-11 in 2003, the CSD Secretariat (UN DESA) changed its approach to civil society and recognized only Major Groups as legitimate stakeholders. Since then, each of the nine Major Groups have had some kind of secretariat or contact persons committed to function as a hub for its constituency. Everyone with ideas and proposals choose a particular Major Group they belong to, work through that group and frame their concerns within that perspective. In today's management model there are Major Groups' Organizing Partners (OPs) functioning as the link between the UN system and the Major Groups constituency. Any accredited civil society organization can bid for the role as the Organising Partner for its constituency, provided the OPs fulfil a set of CSD established requirements that have been developed in close cooperation with civil society. The OP is a service and facilitating function for its constituency, and not a representative position, and is not paid by the UN. The OPs work closely with the Division for Sustainable Development in UN DESA, have frequent e-mail exchanges and regular conference calls among themselves. They keep their constituencies informed, monitor progress in lobby efforts and in programme implementation, coordinate written submissions from their Major Group to the CSD, find representative organizations to

[7] http://www.un-ngls.org/spip.php?page=article_s&id_article=796

attend intergovernmental conferences and meetings, identify difficulties for the Major Group and seek to address them, etc.

In the CSD sessions, between 500 and 800 members of the major groups have participated annually since 2003. Major Groups are traditionally included in every segment of the CSD Organization of Work, except the opening of the High-level Segment and during formal negotiations in the Policy Year. They are, however, excluded from actual decision-making. Following Rio+5 in 1997, CSD established "multi-stakeholder dialogues," a highly innovative consultative mechanism between the major groups and delegations.[8] Deemed hugely successful, the first well prepared dialogues session in 1998 lasted for two full days, enriched the debate and deepened the understanding of the agenda issues. Despite a favourable analysis carried out by UN DESA for the 2002 WSSD[9], the dialogue session was reduced to one and a half hour after CSD-11 in 2003. It was replaced by 'entry points' to allow for major group input throughout the formal plenary sessions of CSD. However, the interactive value of the dialogues sessions were to a large extent lost due to the reduced time, and the major groups have remained critical of the new systems of integration since 2003.

The CSD has also developed Partnership Fairs and an array of side events in which Major Groups, Governments and International Organizations can exchange views. Even though the partnership fairs are elements of the official outcome of the CSD sessions, the side events have continued to remain on the outside of the negotiations.

Application of the 9 Major Groups model in UNEP

UNEP is the other international organization that makes use of the 9 Major Groups as a basis for its public participation management model. This was fully introduced a few years back, with the adoption of the new "Guidelines for Participation of Major Groups and Stakeholders in Policy Design at UNEP".[10] The Guidelines were developed through meetings and electronic consultations over the internet with major groups and stakeholders in 2008-2009.[11] It was decided that the Guidelines would be subject to review after two years, a process currently underway. Through the 2009 Guidelines, UNEP formalised a body called the Major Groups Facilitating Committee (MGFC) and gave its members many of the same functions as the Organizing Partners in the CSD. A majority of the Major Groups have chosen to appoint the same individuals to the positions in both UNEP and CSD. The MGFCconsists of two members from each of the nine major groups, plus two observer members from each of the six UNEP world regions. The regional representatives get elected among the participants in annual Regional Consultation Meetings (RCMs) held in six locations around the world in the fall.

Before the Major Groups concept got adopted, UNEP had been working with NGOs and the broader civil society already since it was created in the Stockholm conference in 1972. After UNCED, following a decision by its Governing Council in 1995, UNEP agreed to support NGO and Major Groups input into project design, implementation and evaluation, policy development as well as environmental governance.[12] In the year 2000, UNEP held its first Global Civil Society

[8]Abbot, K (2011): Civil Society and Global Environmental Governance: Institutional Innovations and Issues. Prepared for: *Workshop on International Environmental Governance: Grounding Policy Reform in Rigorous Analysis*, Berne, 26-28 June 2011.
[9]Background Paper No. 4 DESA/DSD/PC3/BP4 "MULTI-STAKEHOLDER DIALOGUES: LEARNING FROM THE UNCSD EXPERIENCE", Commission on Sustainable Development acting as the preparatory committee for the World Summit on Sustainable Development, Third preparatory session, 25 March – 5 April 2002, SUBMITTED BY THE CONSENSUS BUILDING INSTITUTE, Michele Ferenz.
[10]http://www.unep.org/civil_society/PDF_docs/Guidelines-for-CSO-participation-Aug2609.pdf
[11]http://www.unep.org/civil_society/About/consult-participation.asp
[12]22ndUNEP GC/GMEF, Nairobi, 3-7 February 2003, Items 4 (c) and (d) of the provisional agenda, page 24: Policy issues: Coordination and cooperation within and outside the United Nations, including non-governmental organizations: The role of civil society "Enhancing civil society engagement in the work of the united nations environment programme: strategy paper."

Forum (GCSF), designedto air views related to key issues on the UNEP Governing Council agenda, and todevelop coherent major groups and stakeholders responses to the issues. A similar meeting has subsequently been held annually in conjunction with the UNEP Governing Council/Global Ministerial Environment Forum in February, but in 2010 the name was changed to the Global Major Groups and Stakeholders Forum (GMGSF) for the purpose of being more inclusive of all the Major Groups, since some of them (such as Business & Industry) do not belong to civil society in its most commonly used definition. Representatives from major groups andstakeholders who belong to organizations accredited to ECOSOC or UNEP are invitedto participate in theUNEP Governing Council, where they are seated as observers in the back of the room.

National implementation

UNDP's 2010 Human Development Report summarises the current situation succinctly:

> *"The scope for empowerment and expression have broadened... While real change and healthy political functioning have varied, and many formal democracies are flawed and fragile, policy making is much better informed by views and concerns of citizens. Local democratic processes are deepening. Political struggles have led to substantial change in many countries, greatly expanding the representation of traditionally marginalised people including women, the poor, indigenous groups, refugees and sexual minorities... [but] recent years have also exposed the fragility of some of our achievements — best illustrated by the biggest financial crisis in several decades"*[13].

Agenda 21 encouraged governments to involve Major Groups in national sustainable development governance. In the first decade after UNCED, many countries held national hearings on sustainable development regularly, often involving Major Groups and reporting to the CSD. After Johannesburg there has been a decrease in the interest to produce national reports, they are fewer and most of the ones that do exist have not been developed through a participatory process.[14]

National Councils on Sustainable Development

UNCED encouraged the establishment of so-called National Councils on Sustainable Development (NCSD) with relevant stakeholders included. Early movers to create such national mechanisms to follow up the Rio agreements were Belgium, Finland and the UK, followed by Portugal, Ireland and Germany.[15] In 2002 it was apparent that only one region –Europe – had made efforts to develop National Sustainable Development Councils. The countries present in the WSSD agreed to have operational Councils in all countries by 2005, a year that came and went with only a slight global increase of national councils. However, there are currently around 30 councils from 15 European countries that cooperate with the purpose of sharing knowledge, experience and national views on relevant policies and instruments, as well as giving selected advice on policy developments at EU level. Some positive trends are now also seen in Asia and Africa. The European network of NCSDs involves around 400 key senior actors from academia, civil society/NGOs, stakeholder organizations and the private sector.However, even if

[13] Human Development Report 2010, UNDP, p.6
http://hdr.undp.org/en/media/HDR_2010_EN_Complete_reprint.pdf

[14] Strandenaes, Jan-Gustav. *Sustainable Development Governance towards Rio+20: Framing the Debate.* Sdg 2012 series, Stakeholder Forum.
http://www.stakeholderforum.org/fileadmin/files/sdg2012jangustav.pdf

[15] P 53 in Elni - ENVIRONMENTAL LAW NETWORK INTERNATIONAL, No 1/2005ISSN 1618-2502, ingeborg.niestroy@eeac-net.org

governments pledge support to the major groups, several countries have problems in working with them in a proper way.

Major Group representatives on national delegations

Another example of government efforts to involve non-state actors in policy-making is the inclusion of Major Group representatives (for example NGOs or youth) in their delegations to intergovernmental negotiations on sustainable development and related issues. Whereas some European countries have always had several major group representatives on their delegations, they tend to become fewer, and a lower number of delegations in total provide space for major groups in their delegations. Despite positive signs at the beginning of this millennium, the other regions of the world are also turning away from considering integrating major groups at their official level.

Major Groups Implementation
In addition to making use of the formal channels for public participation provided by Governments and International Organizations, major groups involve themselves proactively to influence sustainable development decision-making in multiple ways. Most of the major groups were involved in big parallel events in Rio at the time of UNCED, in Johannesburg during WSSD[16], and in conjunction with other global summits since 1992. There are several ongoing campaigns, preparation meetings and mobilization efforts for UNCSD. Online tools and social media are in frequent use.

Challenges and Conflicts

Insufficient inclusion of non-state actors in processes
While public participation in intergovernmental decision-making has increased and improved compared to the situation before UNCED, there is a general feeling among Major Groups that they are not sufficiently integrated. There are still occasions when Governments are meeting and Major Groups are not included, and other cases when they are allowed token presence in negotiations but there is a lack of meaningful participation. In some contexts participation had a temporary upswing after UNCED but then decreased again, such as for example with the case of multi-stakeholder dialogues in the CSD. On the national level, the situation is in most cases even worse. Not all countries are equally eager to involve their citizens, and only a few have institutionalized constant participation of Major Groups in national decision-making for sustainable development. There is a lot of room for improvement.[17]

Occasional disrespect of "Nine or None"
Paragraph 23.3 states that participation in the UN associated with Agenda 21 implementation must apply equally to all major groups.Despite this, UN Secretariats and Governments sometimes tend to see civil society as a homogenous category, and fail to provide at least one slot each for the nine Major Groups. If there are fewer slots than nine, the Major Groups are pushed to compete among each other for whose perspective will get heard. By this demand, the plethora of cultures, innovations, approaches and reflections of the peoples in the world are blatantly ignored and politically subdued. In effect this goes against the grain of the UN Charter, beginning with 'we, the peoples'. As long as the current participation model with nine Major Groups is in use, and as long as Major Groups are invited for the purpose of dialogue and perspective sharing, their diversity should be respected. The Major Groups are all different and all equally important, and they should be invited to participate in accordance with the principle of "nine or none".

Inadequate use of Major Groups perspectives
In the current participation model, Major Groups are usually invited to intergovernmental meetings in order share views and opinions, which increases the diversity of perspectives voiced in policy processes. This may be a purpose in itself, but cannot be the end goal. The relevance of intergovernmental meetings lies in finding consensus on how to approach particular issues and reverse negative trends through measures that can and will be implemented since they get widely accepted and are made to work for all. This requires a process to synthesize diverse perspectives into holistic, integral solutions. However, the format in which the input from major groups is delivered today does not maximize the opportunities for governments to embrace and make use of the information in such a way. Written submissions from Major Groups may be read but are

[16] http://www.johannesburgsummit.org/html/basic_info/parallel_events.html
[17] p 57, Nestroy, in Elni - ENVIRONMENTAL LAW NETWORK INTERNATIONAL, No 1/2005 ISSN 1618-2502, ingeborg.niestroy@eeac-net.org

seldom integrated into decisions. In many occasions Major Groups must wait until the end of sessions to speak, when decisions may already be made.

Non-existing Major Groups and missing perspectives

Many find that the 9 Major Groups model is a reductionist approach that invites scrutiny since it is not inclusive enough. For example, while "women" and "youth" have their own Major Groups, "men" and "elderly" do not.[18] In the CSD, there is for example, an informally organized Education Caucus that is not recognized as a Major Group. Academics from social sciences and humanities often feel excluded from the Science and Technology Major Group, and others such as disabled people and religious and spiritual communities would like recognized groups of their own. A Major Group for the voiceless, such as animals, future generations and Mother Earth, has also been proposed. Others would like to move away from the practice of using Major Groups as the basis for inclusion, and instead establish Regional Groups or issue caucuses like before, since that would be a way to bring in perspectives that are missing today. However, the self-organized caucuses that existed in CSD often struggled with deficient legitimacy, so it would be necessary to develop new structures rather than just going back to what existed before. In any case it is absolutely necessary to recognize that civil society contains a huge multiplicity of perspectives, and aim to give space to them all.

Problematic grouping together of the private sector and civil society

Human societies are often understood as consisting of a three-part schema of sectors with profoundly different aims, roles, and needs: (i) government/public sector, (ii) business/private sector, and (iii) civil society. Since all the sectors are important for determining the state and future direction of society, it is natural that the Major Groups model includes all three of them when mapping the most central actors for sustainable development. Most of the Major Groups are fractions of civil society, but the Local Authorities group is ultimately part of the public sector, while the Business & Industry Major Group constitutes the private sector. While crucial that they are all included in Agenda 21, some conflicts may occur when applying the Major Groups as a management model for participation. Civil society groups need special mechanismsand quotas to have a voice in intergovernmental processes, but the profit-making Business & Industry had no problem to influence Government and UN policy without the support they are getting today. When distinctions are not made between Major Groups with different nature, power imbalances may grow bigger instead of being bridged.

Lack of transparency within Major Groups

The different Major Groups in intergovernmental processes are organized in different ways internally. Some have managed to create and adopt rather democratic guidelines or internal rules of procedure for how to make decisions and interact with their wider constituencies. Others have found it difficult to define their constituencies and create channels for communication, which makes the work ad-hoc and less transparent. This may lead to power imbalances when those who are present decide, if a limited number of individuals get proportionately big influence. It may be difficult for others to hold them accountable. Moreover, in cases when the Major Groups Organizing Partners (in CSD) or Facilitating Committee (in UNEP) need to make decisions among themselves, those who respond early can set the tone, while those who have established more inclusive processes and need to wait for feedback from their wider constituencies may miss opportunities. More equally pronounced procedures would be needed in order to ensure fairness between and transparency within all the Major Groups.

[18]Biermann, F., Gupta, A., Accountability and legitimacy in earth system governance: A research framework, Ecol. Econ. (2011), doi:10.1016/j.ecolecon.2011.04.008

Power imbalance, unequal democracy and domination by a few
A big risk with public participation in decision-making is that it may result in unequal democracy, where individuals who are already resourceful are given yet another arena to influence. Those who are going to be most affected are often distant from decision-making, and marginalized groups or perspectives within groups may easily remain ignored. Furthermore, it takes time and effort before individuals can fully grasp and become effective actors in intergovernmental processes, since the organizational culture is strong and the language is full of jargon. Once someone has gained the necessary experience, their participation is perceived as more valuable since they are able to make more constructive contributions. This phenomenon is hard to avoid, but it may be a democratic problem when the same individuals tend to get most opportunities to participate and their roles become almost institutionalized in the system. Experienced individuals need to be aware of this and do what they can at all times to act in an inclusive manner and facilitate for newcomers to enter the scene.

Lack of funding, especially for process work
Major Groups have initiatives that they would like to carry out for sustainable development, but groups from the Global South and Global North alike often lack sufficient financial resources to implement their ideas. In some cases, funding that is available for Major Groups participation could be used more effectively. Of all projects identified in Agenda 21, major group participation in the democratic processes leading up to successfully implemented projects has been hit hardest by lack of funds. Process work for accountability, transparency and participation is one of the prerequisites for good governance, but this has suffered most by lack of financing.

Way Forward

Multi-actor governance is without doubt the way forward for the 21st century. In a world where the links between causes and effects as well as problems and solutions become increasingly complex, and when the ideal future state is just as unknown as the way for getting there, multiple views and perspectives need to come together. The active engagement of all social groups is needed to find solutions that work for all and steer the course towards sustainability.

As this review has shown, the two objectives in the Preamble are confirmed as valid: Broad public participation in decision-making is a prerequisite for sustainable development, and there is a need for new forms of participation. Different new participation models have been tried and evolved over the past two decades. Overall the situation has improved tremendously, but there is still a long list of challenges and conflicts to address. Participation for sustainable development must become even broader and more inclusive, and new innovative models for engagement must be designed that improve transparency, legitimacy, accountability, collaboration, and usability of results.

Agenda 21 called for a move towards real social partnership in support of common efforts for sustainable development. In the ‘Ladder of participation’ described in the introduction to this Preamble review, ‘Partnership’ appears as rung 6. It is possible to create stronger and more genuine partnerships by improving the participation models that are in place today. If there is a wish to go even further in response to the scale of the challenges in today’s transformative world, it would be possible to move up to rung 7 with ‘delegated power’ or to rung 8 with ‘citizen control’. The role of the nation-state is changing with the rising importance of mega-cities, large corporations, and an increasingly global civil society. In this context, Governments may eventually not be able to keep up the relevance of the UN if acting on their own, since the serious mounting crises we are facing require collaborative problem solving. In a future not too far away,

moving up the ladder and sharing voting rights between the public sector, the private sector, and civil society may prove necessary, unavoidable and rewarding.

The suggestions below focus on opportunities for improving participation that can be applied as true social partnerships between the UN, its member states and multiple actors. The UN Conference on Sustainable Development in Rio in 2012, particularly within the theme of the Institutional Framework for Sustainable Development, is an opportunity to raise the questions and improve participation.

Inclusiveness: Increased multiplicity of perspectives
Today's nine Major Groups must all be granted secured space in sustainable development governance. To a larger extent than today, alternative perspectives within each group must be respected for legitimacy and accountability. Regional and gender balance must be improved. Adding more Major Groups would be possible, or changing to a different management model organized around other categories, that would be inclusive of the full variety of groups in society. Regardless of the method for raising inclusiveness, the central message is that civil society includes multiple perspectives that all need to be voiced and considered in its rich diversity. When underrepresented actors do not join the processes on their own accord, International Organizations, Governments and the established Major Groups have a responsibility to reach out and enable their engagement.

Usability: Applicable consensus through collaboration and integration
For true social partnerships, the role of participating actors must go beyond mere perspective sharing to co-produced consensus. Rather than just voicing their concerns as a mess of biased opinions focusing on the self-interest of the own group, there is a need to build true understanding for the concerns of others, and to build common approaches through collaboration. Trust building, respect and transparency are necessary elements for achieving a collaborative context. Sustainable development governance processes on all levels need to be designed to bring about real opportunities for deep communication, learning and reflexivity, in order to shape usable outcomes with transformative capacity. Governments, international organizations, major groups and stakeholders need to build trust and cross borders, combine viewpoints, merge positions and integrate perspectives until a synthesis and genuine consensus can be reached.

Full cycle approach: Bridge knowledge, policy, and implementation
Appropriate responses need to be developed through co-produced knowledge about the situation, followed by inclusive decision-making, and engaging processes for responsible implementation. Actors from all social groups must be involved in all steps of governance: preparation phase (knowledge production), negotiation phase (negotiation policy-making), and follow-up phase (implementation, monitoring and evaluation). These steps must be seen as a full project cycle with integration between them to ensure that implementation does not fall behind. The same committed individuals need to be involved in following issues from idea to result.

Multi-level governance: Bridge local, national, regional and global solutions
Global problems require responses on all spatial levels that do not work against each other. In order to strengthen supportive synergies between global goals and localized solutions, there needs to be greater integration between the local, national, regional and global scenes for decision-making and implementation. Civil society and all major groups are in unique positions to link the grassroots to global corridors and connect spatial contexts by bringing governance levels together, share information about new decisions, lessons learnt and good practices, in all directions. Inclusive and participatory Sustainable Development Councils need to be established in countries where they do not yet exist, and it would be preferable for government-led councils to move

towards a more independent setting.[19] In countries where civil society is not yet well organized, it is important to support their role in meeting global goals by localizing solutions.

Resources: Meaningful participation through funding and capacity-building

Multiple actors need to be provided with opportunities to participate in the most constructive manner. Training, capacity-building and human resource development is crucial. All individuals who get involved need to be welcomed to governance processes by those who are more experienced. Tools for this may be mentorship programmes, language services and facilitative leadership. Meeting facilitators can make a big difference by providing flat structures with equal space to everybody in the room. A plethora of methods for democratic decision-making should be used, such as go-rounds, small group discussions and report-back, spokes-councils, joint agenda setting, etc. Meaningful coordination and participation processes among civil society organizations require reliable and stable financial resources as well. A steady increase in the funding for such processes is needed, with better balance between core- and project-based funding.

[19]Niestroy, Ingeborg (2005). Environmental Law Network International, No 1/2005, page 57. ISSN 1618-2502. ingeborg.niestroy@eeac-net.org

Chapter 24: Global Action for Women Towards Sustainable & Equitable Development

Introduction

Equality of rights for women is a basic principle of the United Nations. The Preamble to the Charter sets as one of the UN's central goals to reaffirm "faith in fundamental human rights, in the dignity and worth of the human person, in the equal rights of men and women".[1] However, there remains a universal tendency towards inequality between women and men. Women have greater responsibility for human reproduction than do men, but have less access to resources and less power in decision-making. Women are also affected more severely by climate change and other, similar global challenges.[2] Bridging gender gaps and ensuring equal opportunities for the world's women is an important aspect of sustainable development. Empowering women is also a tool for meeting other sustainability goals, as women have a key role to play in changing unsustainable behaviours as consumers and producers and as prime conveyors of values to their children.

Understanding where gender inequality comes from is necessary when wanting to address not just the symptoms of the problem, but its root causes, with positive and lasting results. While some differences between men and women are biological, women are not subordinated by nature, but the difference in status between the genders is socially and culturally constructed. All structural inequality, including unequal gender relations, starts with the division of the world into parts – in this case man/woman. Other examples of social categories are rich/poor, white/black, old/young. These divisions are based on the idea that humans are fundamentally different from one another and have different characteristics depending on their sex, ethnicity, age, etc. This belief shapes stereotype images of people, for example that women should be soft, caring, and dependent. In the next step the categories are provided with value, where one part becomes the norm, and the other becomes "the other". Those who belong to the norm are given higher status in many contexts. People everywhere are born into cultures with specific values, norms, ideals and thought patterns. Each individual is placed in many different social categories simultaneously, which may impact their status and access to resources and opportunities in different situation-dependent ways. There are wide cultural differences in the perception of what belongs to each social category and what is expected from a man versus a woman, but men constitute the "norm" in most cultures. This causes the creation and development of unequal gender relations everywhere, which get culturally reproduced, and are expressed in various ways in human societies throughout all aspects of life.

Although cultural norms concerning social categories have certain duration and toughness, they are not permanent and unchangeable. Agenda 21 confirms sustainable and equitable development as an agreed global goal, which means that conscious efforts for changing norms and values in that direction over time are desired in all cultures. Agenda 21 in itself can be seen as a document in which the man constitutes the norm, since it includes a chapter devoted to women but not a specific one for men. Women are thereby assigned with a complementary role in the transition towards sustainable development. This is something that must be adjusted by women themselves as authoritative subjects.

[1] http://www.un.org/womenwatch/daw/cedaw/history.htm
[2] http://www.un.org/womenwatch/feature/climate_change/

The linkages between women's empowerment, gender equality and sustainable development were made explicit on the intergovernmental level in the Third UN Women's Conference which took place in Nairobi in 1985.[3] In preparation for UNCED, a World Women's Congress for a Healthy Planet was held in Miami with more than 1,500 women from 83 countries attending.[4] Together they worked on a strategy towards UNCED and adopted a common platform entitled 'Women's Action Agenda 21' (WAA21). This was used as a platform for women to think and act on the global level across geographical, racial, institutional, age, class, and cultural boundaries.[5] With WAA21 as a tool, women's lobbying in the UNCED process resulted in the inclusion of Chapter 24 in Agenda 21, and at least 145 references throughout the text to the specific situations and roles of women in environment and sustainable development.[6] Also, Principle 20 of the Rio declaration reads as follows: *"Women have a vital role in environmental management and development. Their full participation is therefore essential to achieve sustainable development."*

Implementation

In its World Development Report 2012 – Gender Equality and Development, the World Bank note that there have been many improvements for women and girls in the last quarter century. In particular, the report states that:

- Female life expectancy at birth has increased dramatically in developing countries by 20 to 25 years in the last half century;
- Globally, female life expectancy reached 71 years in 2007 (compared with 67 year for men) and women now outlive men in every region of the world;
- Two-thirds of all countries have reached gender parity in primary education enrollments, while in over one-third, girls significantly outnumber boys in secondary education;
- In many countries, and especially for higher education, these gaps arenow reversing, with boys and young men at a relative disadvantage;
- In a reversal of historical patterns, more women than men now attend universities, with women's tertiary enrollment across the globe having risen more than sevenfold since 1970 (fourfold for men); and
- Between 1980 and 2008, the gender gap in labour force participation narrowed from 32 percentage points to 26 percentage points. By 2008, women represented more than 40 percent of the global labour force.[7]

However, the World Bank notes that progress has not been as good in other gender dimensions. For example, "Health disadvantages that show up in the excess relative mortality of girls and women fall into this category. So do other persistent gender disparities, including segregation in economic activity, gender gaps in earnings, male-female differences in responsibility for house and care work, gaps in asset ownership, and constraints to women's agency in both the private and public spheres. Progress in these domains is difficult to see, despite greater prosperity in many parts of the world. Indeed, many of these gender disparities remain salient even among the richest countries."[8]

[3] http://www.unep.org/gender_env/Historical_background/index.asp
[4] http://www.wedo.org/about/our-story
[5] MacGregor, Sherilyn (2006). *Beyond mothering earth: ecological citizenship and the politics of care.* UBC Press, Vancouver.
[6] http://www.unep.org/gender_env/Historical_background/index.asp
[7] World Bank (2011): World Development Report 2012: *Gender Equality and Development* (Edition: 2011). The World Bank.
[8] Ibid, pg 13

Women in the Millennium Development Goals

Empowerment of women is necessary for achieving all the eight Millennium Development Goals (MDGs) adopted in 2000. Two of the MDGs specifically address women's concerns, namely MDG3 on promoting gender equality and empowering women, and MDG5 on improving maternal health. The Millennium Development Goals are in line with Agenda 21 and have given increased visibility to the critical importance of gender equality.

UN Women is one of the UN entities in charge of implementing the MDGs, and have contributed through operational programmes with innovative strategies, through monitoring and analysis evaluating progress on the MDGs, and through advocacy to raise awareness and encourage participation in MDG activities.[9] Many other UN entities, Governments, women's groups and civil society organizations are also contributing to MDG implementation.

Changing norms and values

Over the past two decades, norms regarding the role of women have progressed fast both legally and on the ground towards greater gender equality in most societies. But at the same time, many women have experienced a decline in their quality of life and a number of governments have turned back advances in female autonomy. Notions on gender permeate different societies to varying extents. Some societies focus on similarities while others give emphasis to differences and may keep women and men separate to a large extent. Matrilineal societies, in which kinship is traced through the female line and often entails that women control land and products, have become less common due to globalization and capitalism.[10] There are however multiple signs that norms and values overall are changing towards greater gender consciousness and increased support for equality. Since this is happening simultaneously in multiple cultural contexts it can be called a positive global trend. In many places it is accompanied by institutionalized norms in the form of progressive laws that strengthen women's roles and gender equality.

Empowerment of women

Empowerment describes the collective process in which women as reflective subjects take control over their own lives, to the extent that their current life conditions allow them to do so. From that position women work together to change and improve their life conditions. The empowerment of women has increased over the last two decades, with a myriad of positive examples as a result. Feminist movements, with content and vision developed by self-organized women, have grown stronger and become visible in countries where they used to be nonexistent or underground. Many feminists recognize that inequalities cannot be solved through incremental changes alone, but that root causes must be addressed through complete transformations of cultures resulting in fundamentally different human societies. Academics, activists and others have started to develop alternative worldviews and approaches to environment and development, which would not create social categories and dividing dualism, and therefore make gender relations truly equal.

Availability of gender statistics and information

Agenda 21 recognized the need to monitor the situation for women around the world, to gather statistics and to keep track of trends on the global and national levels. Paragraph 24.8 called for development of gender-sensitive databases and information systems. General awareness and tracking of gender issues has increased since 1992, and many systems have been put in place for making gender statistics available in comparable formats. A number of global indexes have been developed that offer different perspectives on how to compare the status of women around the

[9] UN Women: MDGs http://www.unifem.org/gender_issues/millennium_development_goals/

[10] Miller, Barbara D. (2002). *Cultural Anthropology.* http://www.d.umn.edu/cla/faculty/troufs/anth1604/cakinship_matrilineal.html

world. The various existing methodologies have their respective strengths and weaknesses. New innovative measurement models are under development for capturing gender inequalities better.

Examples of some of the most widespread indexes and methodologies for measuring the status of women are the Gender-related Development Index (GDI), the Gender Empowerment Measure (GEM), and the Gender Gap Index (GGI). GDI is similar to the Human Development Index in that it measures a country's literacy, life expectancy and income as three dimensions of human development, but it adds a new aspect by weighing the result according to gender disparities. UNDP introduced it through its 1995 Human Development Report. The Gender Empowerment Measure (GEM) was introduced through the same report, and this index measures the participation of women and men in decision-making, politics and economy.[11] In 2006 the World Economic Forum introduced the Gender Gap Index (GGI),and the 2011 report includes data from 135 countries. GGI assesses the relative equality between women and men in access to resources and opportunities, independent from the different levels of development of countries. The result of GGI calculations show almost equal opportunities for the genders when it comes to health and education, while men have more access to economic resources and political opportunities than women.[12]

None of the indexes should be seen as providing a complete and objective picture, and the ranking of countries vary between different indexes. The Scandinavian countries however rank very high in all of them. This shows that governments can make a difference for their women through progressive legal and political action, since the Scandinavian countries have adopted women's empowerment and gender equality as explicit national policies.

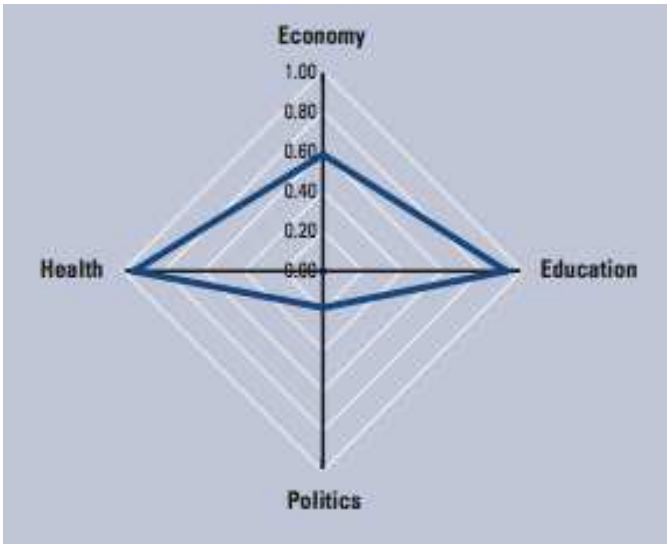

Figure 1. Gender Gap Index — global patterns 2011
Note: Scores are weighted by population. 0.00 = inequality, 1.00 = equality.
Source: The Global Gender Gap Report, 2011.

Elimination of discrimination against women
Most governments have legally committed to bring about equality for women through the UN Convention on the Elimination of Discrimination Against Women (CEDAW), which was adopted in 1979 and entered into force in 1981. With its 187 parties, of which 75 have been added since

[11] http://hdr.undp.org/en/statistics/indices/gdi_gem/
[12] http://www.weforum.org/reports/global-gender-gap-report-2011

UNCED, CEDAW is an almost universal agreement against gender discrimination.[13] In support of strengthening CEDAW, a Declaration on the Elimination of Violence against Women was adopted in 1994, and a CEDAW Optional Protocol with currently 103 parties entered into force in December 2000.[14] The Protocol includes a communications procedure that gives individuals and groups of women the right to complain to the CEDAW Committee about violations of the Convention, and an inquiry procedure that allows the Committee to investigate systematic or grave abuses of women's human rights.[15] Implementation has been mixed, and many states that have ratified CEDAW have not demonstrated efforts to comply even with the minimum expectations outlined in the treaty.

Agenda 21 Paragraph 24.5 calls for the strengthening of CEDAW, particularly its elements on environment and development, including access to natural resources, low-cost housing, creative banking facilities, technology, and pollution and toxicity control. Some progress has been made when it comes to increasing women's participation in environmental decision-making, and it is now common to integrate a gender equality perspective into policies and programs for sustainable development. However there is still a great need to produce gender specific statistics and to make use of them in planning, implementation and evaluation of environmental projects.[16]

Reproductive health care and family planning

Women are inevitably input more effort than men when it comes to reproduction, since they are the ones who give birth. Women's freedom in all spheres is controlled by the extent to which they can plan and choose their reproduction. The worldwide average trend is that women get fewer children than in earlier decades. Pregnancy is a critical condition in a woman's life that makes her vulnerable to complications and in need of extra care. Paragraph 24.3e asks Governments to establish facilities for reproductive health care and family planning. Universal access to reproductive health by 2015 is also one of the targets within Millennium Development Goal 5. Compared to 1992, more pregnant women in all regions are now offered at least minimal care during pregnancy. For example, in 2003, the African Union adopted the Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women in Africa. Better known as the Maputo Protocol, it asserts women's rights to take part in the political process, to enjoy social and political equality with men, and to control their reproductive health. Article 5 refers to the "elimination of harmful practices," including ending polygamous marriage and female genital cutting. Of 53 African countries, 46 signed the protocol, and by February 2011, 30 countries had ratified it.[17] However, not enough women receive the recommended frequency of care.[18]

When it comes to family planning, there is inadequate support in many regions. At least 20% of the world's married women are not using any contraceptive technique or device even though they would wish to limit childbearing.[19] The proportion of women who are using contraceptives is rising, but due to the growing number of women of reproductive age, gains will be difficult to sustain.[20] If a woman gets pregnant when she does not want to, abortion might be an option when available. Abortion laws have become more liberal in many countries in the past decades, but many legal contexts are restrictive. When abortion services are illegal or unavailable due to other

[13] http://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=IV-8&chapter=4&lang=en
[14] http://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=IV-8-b&chapter=4&lang=en
[15] CEDAW Optional Protocol (full text) http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/54/4
[16] Norlin, Anna & Rönngren, Jenny (2011). *Equality is a Human Right*.UN Women National Committee Sweden.
[17] World Bank (2011): World Development Report 2012: *Gender Equality and Development* (Edition: 2011). The World Bank.
[18] UN (2011). The Millennium Development Goals Report 2011.
[19] Seager, Joni (2009). *The Penguin Atlas of Women in the World*. Fourth Edition. Penguin Books, London.
[20] UN (2011). The Millennium Development Goals Report 2011.

factors, many women seek secret and unsafe abortions, which may result in serious illness or death.[21]

Women's unpaid household work

Women are more likely to be wage workers and unpaid family workers than men. In most cultures women have the primary responsibility for unpaid work in the household, while the economic production sphere is male associated. Furthermore, women have less mobility between the formal and informal sectors.

Women everywhere spend much more time than men on unpaid labour to sustain households and families, although in some cultures women and men are sharing increasingly equal responsibilities for the household in cases when they share a home. Household sizes have decreased in all parts of the world over the past two decades, except from in a few countries in northern Africa. It has become increasingly common that households with children are headed by single parents; in 85% of these cases the single parent is the mother. One-person households are also more common today, and elderly women living alone are facing the greatest economic difficulties of all households.[22]

Women's informal domestic work is often overlooked in official labour statistics. In order to better capture the economic contribution of women, Paragraph 24.8e of Agenda 21 suggests that accounting mechanisms would need to be developed to integrate the value of unpaid work carried out by women in their homes. The System of National Accounts (SNA), which is the internationally agreed standard set of recommendations on how to compile measures of economic activity, has responded on this call from Agenda 21 and now includes a section on unpaid household activity. The newest version of SNA was published in 2008.[23]

Paid employment opportunities for women

When comparing the numbers of women and men in the waged work force, there is an overall global trend that the proportion of women is growing. The number of women who participate in the labour market has remained steady in the past two decades, while for men the unemployment rate has been growing globally over the same time period. The gender gap remains considerable despite this trend, since women were severely underrepresented in the waged labour force in 1990 and still are today with women only accounting for 40% of the non-agricultural workforce worldwide.

[21] Seager, Joni (2009). *The Penguin Atlas of Women in the World.* Fourth Edition. Penguin Books, London.
[22] Seager, Joni (2009). *The Penguin Atlas of Women in the World.* Fourth Edition. Penguin Books, London.
[23] European Commission, IMF, OECD, United Nations, World Bank (2009), New York. *System of National Accounts 2008.*http://unstats.un.org/unsd/nationalaccount/sna2008.asp
UN document symbol ST/ESA/STAT/SER.F/2/Rev.5.Paragraph 29.143 onwards.

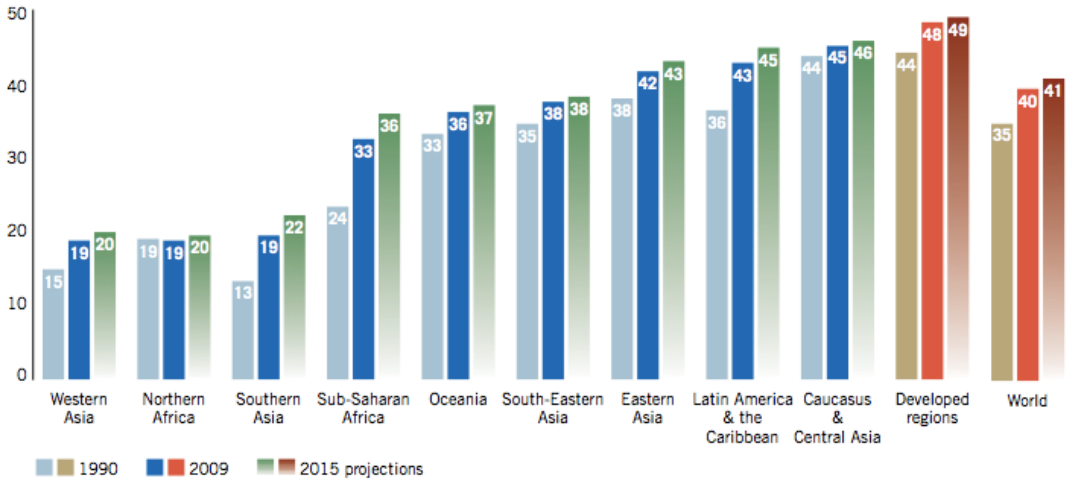

Figure 2. Percentage of employees in non-agricultural employment who are women, 1990, 2009 and projections to 2015
Source: The Millennium Development Goals Report, 2011.

Women's possibility to carry out a paid job is often limited due to their responsibility for childcare and household work. Chapter 24 calls for the availability of social support services that enable women's employment, such as parental leave and day-care facilities for children. A new international standard for minimum duration of maternity leave has been adopted, but many women remain uncovered by the legislation and there is a gap between law and practice. Half of the countries worldwide meet the standard for parental leave and around 40% meet the minimum standard for cash benefits.[24]

Gender differences in productivity and earnings are systematic and persistent. Although they have declined over time (primarily as a result of the reduction in the education gap), they remain significant. Women in the waged work force typically get lower salaries than men, both because they are paid less for the same tasks, and because of the occupational segregation that some jobs are typical for men and others for women. Differences in average wages by gender range from 20 percent in Mozambique and Pakistan to more than 80 percent in Côte d'Ivoire, Jordan, Latvia, and the Slovak Republic.[25] This wage gap applies to most sectors in all regions. It has not been bridged since UNCED even though Agenda 21 paragraph 24.3f asks governments to strengthen equal employment opportunities and equitable remuneration for women through political and economic support. Although the general income and salary levels vary a lot between regions, women remain the poorest of the poor everywhere.

Women and girls in education
Improvements in literacy and education for girls and women are global success stories. Agenda 21 Paragraph 24.3c encouraged governments to take measures to eliminate illiteracy among females and to promote universal access for girls and women to primary and secondary education. Illiteracy rates have been declining steadily over the past decades. However, in 2010 there were 774 million illiterate adults in the world, and two thirds of them were women.[26] This gender proportion has been the same for the past 20 years and applies across most regions.

[24] UN DESA (2010). *The World's Women 2010. Trends and Statistics.* Chapter 4, page 75.
[25] World Bank (2011): World Development Report 2012: *Gender Equality and Development* (Edition: 2011). The World Bank.
[26] UN DESA (2010). *The World's Women 2010. Trends and Statistics.* Executive Summary

In regard to enrollment in education, more girls than ever before are attending primary school, and also studying longer than before. In some countries there is still a higher percentage of boys attending school than girls, but gender gaps have closed in the majority of states. Out of the 72 million children that are not attending primary school despite having the right age, 54% are girls. When it comes to secondary school enrollment, fewer countries are near gender parity although trends are going in the right direction. At the post-secondary level, trends have been reversed and there are now more women than men enrolled in colleges and universities globally, except in Southern and Western Asia and sub-Saharan Africa.[27]

Particular professions that most girls stay away from are applied with much power in the development of the existing society. For example, the differentiation between women and men in natural science and technology is distinctive and has historical roots. Paragraph 24.3c especially mentions science and technology as fields where educational opportunities for women and girls need to increase, and women are still significantly underrepresented there.

Women as consumers

Women have an important role to play in sustainable consumption, and Agenda 21 paragraph 24.3h suggested the design of consumer awareness programs that appeal to women. Some women organizations focus on consumer issues as a main priority or through specific projects or campaigns. Many NGOs, governments, international organizations and others who run programs and activities for consumer awareness have also decided to target women specifically in various ways.

Paragraph 24.3g called for the establishment of rural banking systems to increase rural women's access to credit. This is important since experience shows that finance schemes that specifically target women can have payoffs that are higher than usual.[28]Paragraph 24.8b suggested the need for research on the effects on women of structural adjustment. Many case studies and overviews have been conducted in this regard and show that structural adjustment programmes often have a bias against women.

Women in decision-making and positions of power

Agenda 21 Paragraph 24.3a calls on Governments to establish policies to increase the proportion of women as decision-makers. Women can be found in key leadership roles in business, politics and the rest of society, but in many cases they are still underrepresented. The legal right for women in most countries to hold public office is a success story. However, while adopted targets for improved gender balance in decision-making are common, in practice women are still highly underrepresented in all levels of governance. In 2010 there were only 14 women in the world holding the position as Head of State or Head of Government for their country, and on a global average only one sixth of all Ministers were women. Only 23 countries have over 30% women in the lower or single house of their national parliament. Also in most local governments there is a low percentage of women. When it comes to decision-making positions in the private sector, women are highly underrepresented as well, and of the 500 largest corporations in the world, only 13 have a female Chief Executive Officer.[29]

There is greater awareness today that policies affect women and men differently, and that care needs to be taken to avoid unwanted consequences. It has become more common and in some

[27] UN DESA (2010). *The World's Women 2010. Trends and Statistics.* Chapter 3, page 43.
[28] UNEP (2007) 4th Global Environment Outlook. Page 351.
[29]UN DESA (2010). *The World's Women 2010. Trends and Statistics.* Chapter 5, page 111.

cases standard practice to conduct a gender impact analysis before adopting policies and programmes.

Quota systems are meant to recruit women into areas where they are usually underrepresented. A Global Database of Quotas for Women was launched in a revamped version on 8 March 2010.[30]

Women in environment and ecosystem management

Paragraph 24.8d calls for more research on linkages between gender relations, environment and development. Available research shows that gender issues and environmental issues are closely linked together, and that women play a very important role in protection of the environment and conservation of natural resources. Several studies have concluded that women's involvement in ecosystem management helps avert environmental degradation. While the research area has grown significantly, there is still a need for further studies for better understanding of strategies to leverage on this. Para 24.3f states that women need equal access to land and other national resources. The Nairobi Forward-looking Strategies for the Advancement of Women adopted in 1985 includes strategies with regard to women's participation in national ecosystem management and control of environment degradation, and the first objective of Chapter 24 calls for their implementation. Women's historic disadvantages with regard to rights and access to resources make them highly vulnerable to climate change. Moreover, climate change is likely to magnify existing patterns of gender inequalities.[31] Women appear more vulnerable in the face of natural disasters, with the impacts strongly linked to poverty. A recent study of 141 countries found that more women than men die from natural hazards.[32] Still today, women are underrepresented in environmental decision-making from the local to the global level.[33] Paragraph 24.8g outlines the need to create training, research, and resource centers to disseminate environmentally sound technologies to women, and while some work has been done, the need still remains.

Major Group implementation

Women NGOs and movements active on Agenda 21 issues

Women's activism and feminist movements have a long and diverse history. Women's non-governmental organizations (NGOs) have been established since the 1980's on the local, national, regional, and international levels, where they are important catalysts for women's empowerment and for adding a gender perspective to sustainable development. Agenda 21 paragraph 24.3b supports the strengthening of women's NGOs. Since UNCED, organized women's groups have continued to connect gender and sustainability issues from the grassroots to the UN, including ecofeminist movements and many others. A number of thematic women's networks have been formed around many of the issues in Agenda 21. Examples of such groups are the Gender and Climate Change Network, ENERGIA International Network on Gender and Sustainable Energy, the Gender and Water Alliance, Women Organizing for Change in Agriculture and Natural Resource Management (WOCAN) and the gender and biodiversity network Diverse Women for Diversity.[34] A number of organizations were also formed to give a stronger voice to civil society women from different world regions, for example the Asian Women's Network on Gender and Development (AWNGD) and Women in Europe for a Common Future (WECF).

[30] http://www.idea.int/gender/quotas_numbers_balance.cfm
[31] UNDP 2007/2008 UNDP Human Development Report on *Fighting Climate Change*
[32] Neumayer and Plümper 2007. The Gendered Nature of Natural Disasters: The Impact of Catastrophic Events on the Gender Gap in Life Expectancy. Annals of the Association of American Geographers, 97(3), 2007, pp. 551–566
[33] UN DESA (2010). *The World's Women 2010. Trends and Statistics.* Chapter 7, page 154.
[34] Dankelman, Irene (2005). *Women: Agents of Change for a Healthy Environment.* http://www.ww05.org/english3/speech/5.2.IreneDankelman.pdf

Women's Action Agenda for a Healthy and Peaceful Planet 2015

The Women's Action Agenda 21 (WAA21) developed by women in the UNCED preparatory process became a platform for women's common advocacy work in Rio. In the following decade it was widely spread and mobilized women to lobby for their priorities in multiple contexts on all spatial levels, including in civil society, the private sector, in governments, international institutions and UN conferences. In the preparatory process for the Johannesburg Summit, women groups recognized that the issues in WAA21 were still highly relevant, but that the framework and approaches had changed. The Women's Environment and Development Organization (WEDO) and the Network for Human Development (REDEH) recognized this and took the lead in facilitating a process for updating and revitalizing the platform. An international activist working group reached out to women in all regions for a broad consultation, including electronic channels and discussions organized in the margin of the UN's Preparatory Committees for WSSD and other meetings. The result became the Women's Action Agenda for a Peaceful and Healthy Planet 2015 (WAA2015). 2015 was chosen in order to give the document the same timeframe as the Millennium Development Goals.[35] WAA2015 aims to look at the future with a holistic perspective and includes recommendations for five action areas: Peace and Human Rights; Globalization for Sustainability; Access and Control of Resources; Environmental Security and Health; and Governance for Sustainable Development.[36]

Women's Major Group in the Commission on Sustainable Development (CSD)

As a basis for its multi-year programme of work after the Johannesburg Summit, the CSD decided upon seven two-year cycles with thematic clusters of issues in its 11th session in 2003. Since then the nine Major Groups have been involved in the CSD through Organizing Partners (OP's). WEDO became the first Organizing Partner for the Major Group for Women for the 2004-2005 cycle.[37] When the new cycle was about to start, the Women's Major Group decided to rotate its OP's every second year, to make sure that the particular interest and expertise of the women's organizations in charge were relevant to the CSD thematic issues. During the 2006-2007 cycle, the thematic cluster included energy for sustainable development, industrial development, air pollution/atmosphere, and climate change. WEDO continued as Organizing Partners together with ENERGIA, who actively involved groups from the national level and based their presentations at the UN on extensive field experiences and multiple case studies. In 2008-2009, the topics were agriculture, rural development, land, drought, desertification, and Africa. The new OP's were Women Organizing for Change in Agriculture and Natural Resources Management (WOCAN), African Women Leaders in Agriculture and Environment (AWLAE), and Gratis Foundation from Ghana.[38] For the 2010-2011 cycle when the thematic focus was on chemicals, mining, sustainable consumption and production, waste management and transportation, Women in Europe for a Common Future (WECF) and the Voices of African Mothers (VAM) were the Organizing Partners for Women.[39] Rotating the OP's is regarded as a rewarding practice for the Women's Major Group, since it has brought fresh enthusiasm to the role and increased the motivation to disseminate information and mobilize other women's networks to work on the issues on different levels around the world.

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[35] *Women's Action Agenda for a Peaceful and Healthy Planet 2015. Consultation Process.* http://www.worldsummit2002.org/texts/report_waa2015consultation.pdf

[36] WEDO, Redeh, Heinrich Böll Foundation. *Women's Action Agenda for a Healthy and Peaceful Planet 2015. A decade of women's advocacy for sustainable development.* http://www.wedo.org/wp-content/uploads/agenda2015_eng.pdf

[37] http://www.un.org/esa/dsd/dsd_aofw_mg/mg_orgapart0405.shtml

[38] http://csd-women.groupsite.com/main/summary

[39] http://www.uncsd2012.org/rio20/index.php?menu=104

Women's advocacy on climate change
Chapter 24 lists some areas requiring urgent action, including drought, desertification and deforestation. An issue closely linked to these areas that has grown in importance is climate change. Women are involved in climate change adaptation in local communities, as well as advocating for stronger climate policy at the international level. Women are active in the UN Framework Convention on Climate Change (UNFCCC) through a Women and Gender Constituency that was granted provisional constituency status to the UNFCCC in November 2009. The constituency currently includes only accredited observer NGOs, and everyone active on gender and women issues who do not belong to a UNFCCC registered NGO may apply for accreditation through them. Since neither the UNFCCC nor the Kyoto Protocol include references to women, the constituency advocates for the recognition of women both as a vulnerable group and crucial actors in climate change mitigation and adaptation.[40]

Challenges and Conflicts

Conflicting views within feminist movements
The world political power system is characterized and reproduced through divisions. A clear example is the historic division between North and South that have given women from different parts of the world very different starting points and preconditions. Conflicts arise because of different views on economy, religion, culture and development.

Traditional women's roles barrier to gender equality
There is still a general lack of gender consciousness in most countries. To date, no country in the world has achieved total equality between women and men. Attitudinal barriers are deeply rooted in patriarchy-based societies where men are considered superior to women. Inequalities have an impact on all spheres of activity, including politics, economics, social and environmental. In many countries, tradition is considered as main barriers for women who engage in public processes. Gender inequalities are often deeply rooted in culture and are manifested by strict division of labour. Although traditional gender roles may vary within different cultures and communities, tasks carried out by women are often in the domestic sphere and regarded as less valuable. Barriers to gender equality are of multiple kinds and change would be required in attitudes and mindsets. Even when there is theoretical awareness of gender concerns, it takes substantial effort to change traditional balances of power relations.

Institutional obstacles for women
Women face a number of institutional barriers that need to be addressed before sustainable development issues can be an integrated and natural element in gender policies. Even though progress is being made through the efforts of the MDGs, poverty and illiteracy still remain interconnected problems that prevent civic participation, particularly for women who constitute70% of the world's poor. There are fewer opportunities for women to participate in decision-making. A systematic disempowerment has left women with little presence in political bodies, resulting in the exclusion of their issues and concerns from the policy agenda. Political parties, electoral systems, and legislative assemblies also represent structural barriers to women's full and equal participation in politics. Electoral systems and political parties can both advance and limit political opportunities for women and must be changed to allow for equal opportunities in all aspects of sustainable development.

[40] http://www.wecf.eu/english/articles/2010/12/report-womengender.php; http://www.gendercc.net/about-gendercc/activities/women-gender-constituency-in-the-unfccc.html

Way Forward

Opportunities for women through attitudes change
Achieving gender equality requires active efforts to redress power imbalances and change the existing gender roles of men and women. Important steps would be for women to share equally in decision-making at home and in their communities, to have equal opportunities for education, work and financial independence, and to be able to pursue their personal ambitions. It will be important to provide assistance on gender integration and mainstreaming into policies and projects. In order to increase the expertise for doing so, a set of priorities for ensuring future success in capacity building, gender mainstreaming in thematically focused field projects and markets, policy influencing, and networking. This can be further interpreted as building greater awareness among governments and the international community about the importance of gender issues in planning and policies, and to have that awareness reflected in new, concrete commitments and actions by governments and other development actors to mainstream gender considerations into decision-making in field projects.

Address persistent educational disparities
Despite the overall progress, primary and secondary school enrollments for girls remain much lower than for boys for disadvantaged populations in many Sub-Saharan countries and some parts of South Asia. Policies are urgently needed to improve access to education for girls and young women when poverty, ethnicity, or geography excludes them, and to reach boys where gender disadvantages have reversed.

Access to sexual and reproductive health and rights
Population dynamics, including growth, urbanisation and migration, interact with the environment to influence availability of natural resources, biodiversity, climate change and other key sustainable development priorities. Ensuring universal access to sexual and reproductive health programmes that respect and protect human rights would enable all women and couples to plan and space their children as they wish, offering scope to achieve population stabilisation and contribute to poverty alleviation, gender equality, environmental sustainability and other important aspects for sustainable development.

Make financial mechanisms accessible by women
Specific opportunities should be created for women's access to international and national funding programmes for sustainable development, development of entrepreneurship, and rural and agriculture funding. The European Union has funds to help women set up businesses, and this for example could be provided in other regions. Current micro-grant programmes of international organisations and funds should be extended with the aim to have 50% of all the funding reach the local level. Governance of financial mechanisms should aim at gender parity, regional balance and participation of civil society. Several organizations have provided submissions to UNFCCC on how to increase access for women to climate funding mechanisms.

Support women through access to energy and basic infrastructure
The UN General Assembly has designated 2012 as the International Year of Universal Energy Access. Achievement of the goal would represent a key step towards enabling women to develop their full political and economic potential by freeing up their time and labour. Energy access projects would reduce greenhouse gas emissions and support sustainable economic development. Women could initiate projects and become energy entrepreneurs with appropriate investments, incentives, training and empowerment. In addition, women responsible for rural households need access to low or zero-interest loans that would enable capital investments in basic infrastructure

such as water, sanitation, housing, and schools. For example, city dwellers only need to pay for a connection charge to an existing electricity grid or water supply system, and the same should apply to poor rural communities.

Improve women's participation in UN policy making

There is a need to strengthen the participation of women practitioners from grassroots organizations on the ground. UN Women could improve their participation model to include all the nine major groups through similar processes as the current practices in CSD. The major groups should be self-organized, but be based on democratic processes. The thematic rotation model applied in the CSD Major Group for Women is a good practice. For participation in the CSD and related processes, the women's major group is one of the most underfunded, despite their great efforts at fundraising and despite the political commitments to focus on gender and women's empowerment. In order to change this, a quota for women in decision-making structures is required, as well as a commitment by donors and international organizations to allocate funding to assure capacity building and participation of women in policy processes. Many good examples of successful women's leadership training programmes exist that can be upscaled.

Organize a Fifth UN World Conference on Women in 2015

The Third UN World Conference on Women in 1985 adopted the Nairobi Forward-Looking Strategies, and the Fourth UN World Conference on Women in 1995 advanced the agenda for women in sustainable development. Women's groups are calling for a Fifth UN World Conference on Women to be held in 2015, on the 20th anniversary of the Beijing Declaration and Platform for Action. The Conference could include an evaluation and upgrading of the Women's Action Agenda for a Healthy and Peaceful Planet 2015 and the Women related Millennium Development Goal. There is an enormous potential of a Fifth World Conference on Women as a consciousness-raising event. It would bring current and future women leaders together and mobilize their involvement in the sustainability transformation's urgently needed change.

Chapter 25: Children and Youth in Sustainable Development

Introduction

Children and Youth constitute about half of the world's human population and are crucial partners in sustainable development. They are sometimes called the 'moral stakeholders', since they are likely to be hit the hardest by negative trends in their lifetimes and stand to lose the most as a consequence of global inaction. At the same time young people are key agents for social change, since they are innovative thinkers and energetic doers who take initiative for problem solving if given the opportunity. It is therefore in everybody's interest to involve children and youth, by finding appropriate ways to harness their imagination and encourage their commitment to sustainable development.

According to the most common UN definition, 'children' are young people below the age of 15, and 'youth' are those between 15-24 years old. UN Member States apply various other definitions, and many youth organizations have established their own age limits with different ranges. The Major Group for Children & Youth (MGCY) in the Commission on Sustainable Development has established 30 as its upper age limit.[1] While belonging to the same Major Group and having a lot in common as young people, youth and children are two separate groups with different needs. Youth usually prefer and should be trusted to mobilize themselves, while children more often need others to advocate for them. Projects and activities addressed to children versus youth need to be planned and implemented with different approaches.

The main UN agency mandated to work on children is the United Nations Children's Fund (UNICEF), founded in 1946. For youth there is no UN agency on the equivalent level, but in 1965 UN Member States endorsed a Declaration on the Promotion among Youth of the Ideals of Peace, Mutual Respect and Understanding between Peoples.[2] A UN Youth Unit was established in Vienna, Austria in 1981, with the task to prepare for 1985 to be the International Youth Year. The International Youth Year was widely celebrated and brought more attention to the role of young people in the world. The UN General Assembly endorsed guidelines that recognized that young people are not a single demographic entity, but a broad category with various subgroups. Many UN agencies got motivated to start working with youth as a follow-up of the International Youth Year.[3]This is the context in which the inclusion of Chapter 25 in Agenda 21 on Children & Youth in Sustainable Development was promoted.

Leading up to UNCED, youth organizations got involved in the process with a few individuals attending the early Preparatory Committee meetings, but later in a broader and more coordinated manner. An international youth campaign called A SEED (Action for Solidarity, Equity, Environment and Development) was launched on the road to Rio. Some other international and regional youth organizations had their own initiatives towards UNCED, such as ISMUN (International Student Movement for the United Nations), AIESEC International, and Youth for Development and Cooperation (YDC), among others.[4] In August 1991, youth participating in UNCED PrepCom III in Geneva lobbied strongly and successfully on governments for the incorporation of a Youth Chapter into Agenda 21.[5] From 22-29 March 1992, a World Youth

[1]CSD Major Group for Children and Youth. Processes and Procedures Document – April 2011. http://www.youthcaucus.net/content/download/303/1820/file/MGCY%2520Processes%2520and%2520Procedures_ADOPTED_April2011.pdf
[2]http://www.un.org/esa/socdev/unyin/documents/ares2037.pdf
[3]http://social.un.org/index/Youth/WhoWeAre/HistoryofUNPY.aspx
[4]*Youth Sourcebook on Sustainable Development.* Winnipeg: IISD, 1995. Online. Internet. http://iisd.ca/youth/ysbk086.htm
[5]*Youth Sourcebook on Sustainable Development.* Winnipeg: IISD, 1995. Online. Internet. http://iisd.ca/youth/ysbk000.htm

Preparatory Forum for UNCED (YOUTH'92) gathered more than 300 young people from 97 countries. In UNCED itself, youth participation was diverse in terms of content, actions, and spaces, both inside the UN venue and in the parallel NGO forum.

Implementation

International implementation

Building upon the Convention on the Rights of the Child

Paragraph 25.14b of Agenda 21 supports and encourages the advancement of the Convention on the Rights of the Child, which was adopted in 1989 and entered into force in 1990. Today the Convention has 193 parties. In 2000, the UN General Assembly adopted two Optional Protocols to the Convention. One of them addresses the involvement of children in armed conflict, and the other one focuses on the sale of children, child prostitution and child pornography. Both entered into force in 2002 and more than 100 countries have signed and ratified each of them today.[6]The Convention on the Rights of the Child is the first human rights treaty that grants a role in its implementation to a specialized United Nations agency, UNICEF. As part of this work, UNICEF is actively supporting ratification and implementation of the Convention and the Optional Protocols in nearly 160 countries. They have created databases that focus on lessons learnt and have begun to develop indicators to assist Governments in monitoring their progress on child rights.[7]

Children at the heart of the Millennium Development Goals

The Millennium Development Goals (MDGs), adopted in 2000, are of course too young to be mentioned specifically in Agenda 21. However, Agenda 21 Chapter 25 encourages the UN system to focus more attention on children in future global goals and programmes, and six of the eight MDG's relate directly to children. Meeting the remaining two goals would also make critical improvements in children's lives. Paragraph 25.15 in Agenda 21 invites UNICEF to develop programs for children in cooperation with other UN organizations, governments, and NGOs. Along with other UN agencies and global partners, UNICEF has taken the MDG's as part of its mandate and initiated several activities for their implementation.[8] The Millennium Development Goals Report 2011 shows that while significant efforts towards achieving the MDGs have been made, reaching all the goals by 2015 remains a big challenge. The world's poorest and most vulnerable children are being left behind, still lacking nutrition and facing serious threats to survival.[9]

Institutional arrangements for youth in the UN

As mentioned in the introduction, a UN Youth Unit was established in Vienna in 1981. In 1993, the Youth Unit moved to New York to be placed under the Division for Social Policy and Development (DSPD) of the Department of Policy Coordination and Sustainable Development (DPCSD), created on the invitation of Agenda 21's Chapter 38 on Institutional Arrangements. In 1997, the Youth Unit became part of the Department of Economic and Social Affairs (DESA). It kept being the focal point on youth for the UN system, but in 2001 it was renamed the United Nations Programme on Youth.[10] Since 2010, the UN Programme on Youth is the permanent co-chair of the United Nations Inter-Agency Network on Youth Development (IANYD), a network

[6] http://www.unicef.org/crc/index_protocols.html
[7] http://www.unicef.org/crc/index_30214.html
[8] http://www.unicef.org/mdg/index_whatunicefisdoing.htm
[9] http://www.un.org/millenniumgoals/11_MDG%20Report_EN.pdf
[10] http://www.unyouth.com/index.php?option=com_content&view=article&id=94&Itemid=28

consisting of around 30 UN entities whose work is relevant to youth. IANYD was created with the aim to avoid overlap and strengthen complementarities between different initiatives for youth within the UN, and thereby increasing the effectiveness of UN work in youth development.[11] This is in line with Paragraph 25.10 of Agenda 21, which encourages a review of youth programs and their coordination.

Figure 1. Priority Areas of World Programme of Action for Youth

World Programme of Action for Youth (WPAY)

1995 marked the tenth anniversary of the first International Youth Year. The UN and its member states celebrated this by adopting an international strategy towards the new millennium, the World Programme of Action for Youth to Year 2000 and Beyond (WPAY).The Programme seeks to improve the situation for youth in 15 priority areas.[12]UN member states are responsible for implementation of the WPAY, but the UN secretariat can offer assistance and support where appropriate. In 2005, the United Nations General Assembly developed specific and measurable goals and targets for implementing the WPAY, but there has been no completed procedure for reporting on progress.[13]

UN funding for youth activities

Paragraph 25.10 encourages the promotion of the UN Trust Fund for International Youth Year. The Fund was established with the purpose to support the preparation and follow-up of the 1985 International Youth Year, and is still in existence. It is now mainly used for Governments to voluntarily contribute financial resources to WPAY implementation. However, there is no information about the size of the fund and about which governments contribute to it to make it available to the public, and neither is it possible to find other numbers on the UN Secretariat's

[11] http://social.un.org/index/Youth/YouthintheUN/InterAgencyNetworkonYouthDevelopment.aspx
[12] http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N96/771/43/PDF/N9677143.pdf?OpenElement
[13] http://www.soros.org/initiatives/youth/articles_publications/publications/mapping-of-donors-20100322/mapping-of-donors-20100322.pdf

spending on WPAY. Since the UN works on youth issues both on the global, regional and national levels and through highly diverse agencies, it is very difficult to calculate even a "guesstimate" of what the UN system spends on youth activities annually.[14]

International Youth Days and International Year of Youth

In 1998, a World Conference of Ministers Responsible for Youth held in Lisbon, Portugal, recommended that 12 August would be declared the International Youth Day. The International Youth Day (IYD) has since been celebrated with different themes every year. Many have been relevant to the sustainable development agenda, for example the IYD 2009 was on the theme Sustainability: Our Challenge, Our Future.[15] Through a resolution in 2009, the UN General Assembly proclaimed the year starting on 12 August 2010 the International Year of Youth (IYY).[16] The International Year aimed at advancing the full and effective participation of youth in all aspects of society. It also encouraged young people around the world to dedicate themselves to bringing about positive global change, such as contributing to the UN Millennium Development Goals (MDGs).[17]

UNEP Tunza Strategy for children and youth

In 2003, the UNEP Governing Council adopted a long-term strategy on the engagement and involvement of young people in environmental issues, named the Tunza Strategy. The word 'Tunza' is Kiswahili and means 'to treat with care or affection'. The first six-year strategy from 2003-2008 had four focus areas: awareness building, youth in decision-making processes, capacity-building, and information exchange. These remain crosscutting in the 2009-2014 strategy, in which activities have been aligned with the six priority areas in the UNEP wide medium-term strategy: climate change, environmental governance, resource efficiency – sustainable consumption and production, ecosystem management, disasters and conflicts, and harmful substances and hazardous waste. UNEP involve both children and youth in various outreach activities around those issues. Every few years UNEP organizes an International Tunza Conference for children and/or youth active on environmental issues. A Tunza Youth Advisory Council (TYAC) with 14 youth members is elected every second year. The TYAC, composed by two representatives from each of the six UNEP regions and two indigenous youth, is tasked to promote youth engagement with UNEP and to facilitate youth input in local, national, regional and international environmental fora.[18] On the children side, there is a Tunza Junior Board providing suggestions on how to make UNEP activities more appealing to children and how to sensitize children on environmental issues.[19]

National and regional implementation

Educating children and youth

Chapter 25 asks governments to ensure that their children and youth get access to basic education, since education in general is important for sustainable development and the abilities of children and youth to be involved and aware as active citizens in their societies. The 2nd Millennium Development Goal adopted by Governments in 2000 is asking for the same, with the target that both boys and girls everywhere will be able to complete a full course of primary schooling by 2015. Enrolment in primary education has increased in the developing world as a whole, but

[14] http://www.soros.org/initiatives/youth/articles_publications/publications/mapping-of-donors-20100322/mapping-of-donors-20100322.pdf
[15] http://social.un.org/index/Youth/InternationalYouthDay.aspx
[16] http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N09/469/87/PDF/N0946987.pdf?OpenElement
[17] http://social.un.org/YouthYear/background.html
[18] http://www.unep.org/tunza/youth/AdvisoryCouncil/TunzaAdvisoryCouncilMandateandGuidelines/tabid/3880/language/en-US/Default.aspx
[19] http://unep.org/tunza/children/

progress is very slow. In 2009 the net enrolment ratio was 89 percent, which is only 7 percentage points more than in 1999, and the speed for improvements has slowed in the most recent years, making it far from certain that the MDG target will be reached by 2015.[20] In addition to basic education, it is important that more children and youth get access to education for sustainable development in particular. Although the Decade on Education for Sustainable Development is currently celebrated, very few countries have added sustainable development education to their official public school curricula.

Unsustainable trends in youth employment

Another area that still needs urgent attentionis youth unemployment, included in paragraph 25.6 of Agenda 21 as something that every Government should address. According to a report from the International Labour Organisation (ILO) in 2010, global youth unemployment has hit a high record and is expected to rise further. There are currently over 207 million unemployed people in the world, of which youth represent 80-82 million, or 40 per cent. The ILO's figures show a strong link between the economic crisis and rising youth unemployment.

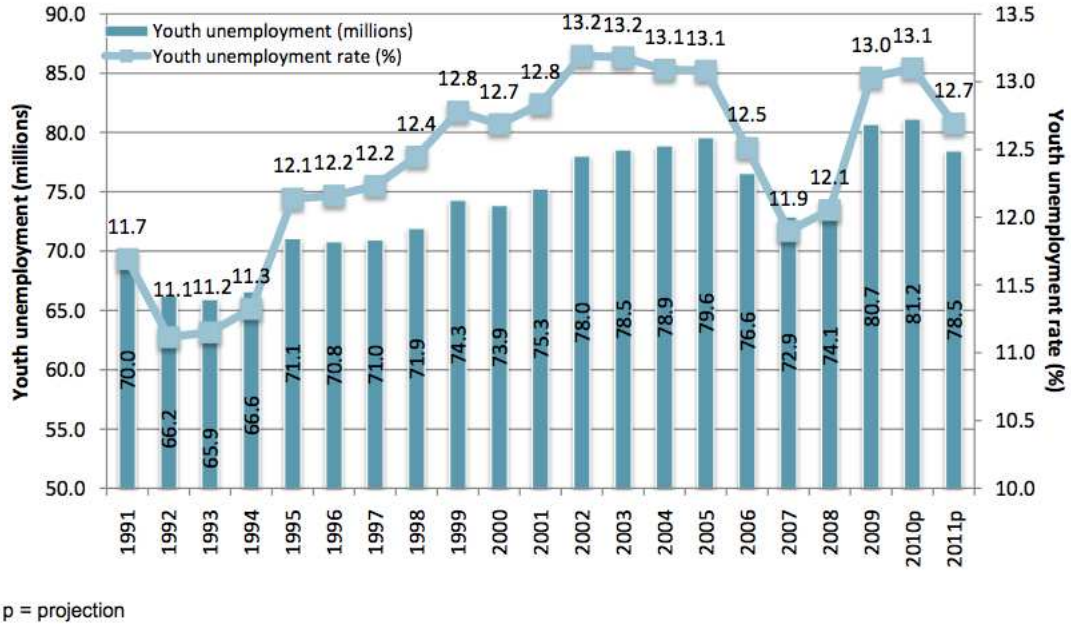

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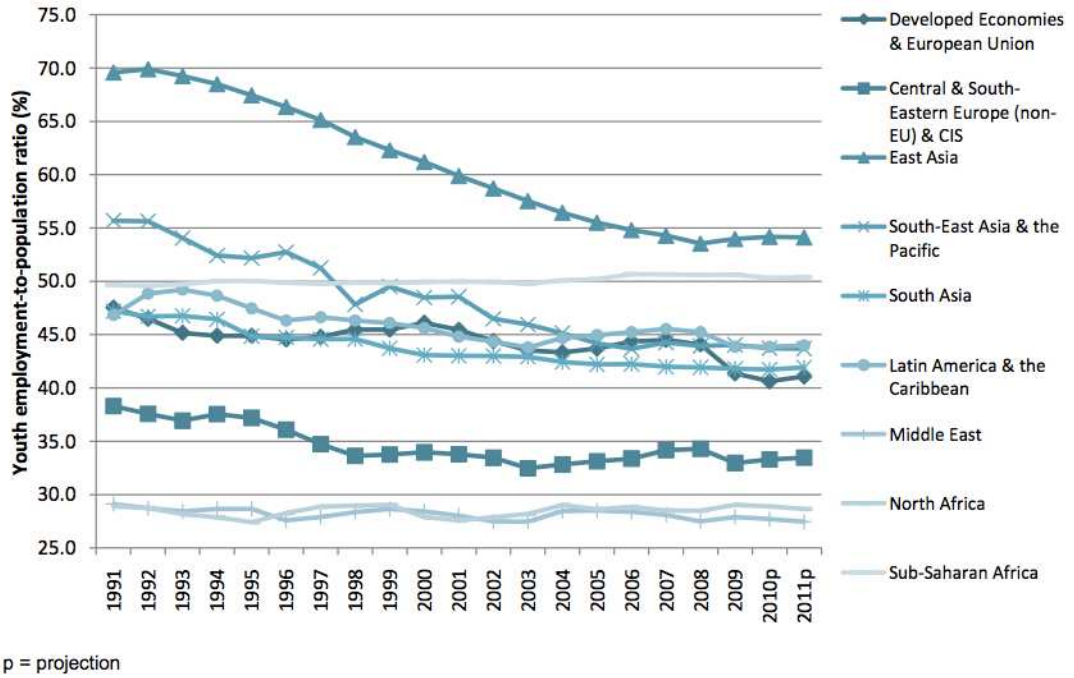
Figure 2. Global youth unemployment and unemployment rate, 1991 to 2011

Source: ILO, Trends Econometric Models, April 2010

In most world regions, the unemployment rate for youth is disproportionately high when compared to the rate for the entire population. Youth are two to three times more likely to be unemployed than their adult counterparts.[21]

[20] UN (2011). The Millennium Development Goals Report 2011.

[21] ILO (2010). Global Employment Trends for Youth. http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_elm/---trends/documents/publication/wcms_143349.pdf



p = projection

Figure 3. Youth employment-to-population ratio by region, 1991 to 2011
Source: ILO, Trends Econometric Models, April 2010

Consulting children and youth in decision-making

Paragraph 25.9 asks governments to consult youth of both genders in environmental decision-making processes on local, national and regional levels, and to promote dialogue with youth organizations regarding environment plans and programmes. Since UNCED, the world has seen a growing acceptance of the importance of youth participation in decision-making. Successful efforts to engage youth have led to improved policy formulation, implementation and evaluation.[22] However, while youth parliaments, youth panels and contact groups have been put in place in some places, this is far from mainstreamed and still needs to become much more institutionalized. Governments are also asked to involve young people in implementation, and while both children and youth are proactively carrying out sustainable development activities in line with Agenda 21 implementation, Governments should reach out for more leverage, provide support and recognition of such positive initiatives. Paragraph 25.9h asks governments to include youth representatives in their delegations to international meetings. This is done by some governments with positive results, but could be far more widespread in CSD as well as in other contexts.

National and regional Years of Youth

The latest International Year of Youth was preceded by a number of national and regional celebrations. 2008 was the African Youth Year and Iberoamerican Youth Year. The Russian Federation designated 2009 as an official youth year, and the African Union has declared 2009-2019 as the decade of youth development in Africa.[23]

Major groups implementation

After having gained formal recognition by UNCED and Agenda 21 in 1992, Children and Youth has become a Major Group displaying energy, vitality and imagination on the intergovernmental

[22] *World Youth Report 2005*, United Nations publication, No. E.05.IV.6, chap. 4.
[23] http://social.un.org/youthyear/unianyd.html

arena, and are today active on most issues related to sustainable development in all countries of the world. In addition to concerns for the current environmental, social and economic conditions, the Children and Youth Major Group often takes on the role to provide a voice for the voiceless, yet unborn future generations.

NGOs in support of children's rights

Many adult-led NGOs work to promote the rights of children and to improve the situation for the youngest. For example, the Childwatch International Research Network is a global, non-profit, nongovernmental network of institutions that collaborate in child research for the purpose of promoting child rights and improving children's well-being around the world. It was founded in 1993 as a response from the research community to the United Nations Convention on the Rights of the Child, and collaborates to support UNICEF.[24] Another research institute is the International Institute for the Rights of the Child (IDE) founded in 1995.[25] An example of an NGO that works for children's environmental health and education for sustainable development is the Earth Child Institute (ECI), trying to meet the rights, needs and capacities of children as key stakeholders of the future.[26] ECI is the secretariat for the Power of One Child Global Network which advocates for the creation of a sustainable future for all and for the rights, needs and capacities of children in the environmental sector by connecting and engaging organizations and people working with children and the environment in heart-centered, results oriented, participatory approaches.[27]

Youth movements for sustainable development

Youth around the world are engaged in practically all chapters of Agenda 21, and have shown great strength relating to the big issues that came out of UNCED in 1992. This voluntary work takes place in various ways on all spatial levels, sometimes actively promoted as related to Agenda 21, while many times just contributing to the goals of Agenda 21 without a pronounced connection. Youth is essentially a very diverse group, and therefore doesn't have a single dominator and cannot be placed in a single political framework against such a repressor. Within their diversity, youth identify with or against different aspects of society, including those aspects that oppress other sectors. It becomes a political choice to identify with or against these oppressive forces, and it is here that the commonality bridges the diversity, hence forming a youth movement towards change. Youth use a wide range of methods for mobilization for sustainable development. Non-formal education, as mentioned in Chapter 25 as something that should be promoted by governments, is an important tool for many youth NGOs.

World Youth Congresses

When Governments met in 1997 to follow up UNCED in the Rio+5 meeting, youth were frustrated with the lack of progress in Agenda 21 implementation. This led to the birth of the World Youth Congress series, first conceived as a Young People's Earth Summit and then developed into a process to support youth contribution to the Millennium Development Goals (MDGs). The first World Youth Congress held in 1999 identified ten key priorities for the new millennium – eight of which closely mirrored he UN MDGs adopted a year later. Peace Child International was one organization behind the World Youth Congresses that have taken place in Hawaii 1999, Morocco 2003, Scotland 2005, Quebec 2008, and Turkey 2010. The 6th will be held in Rio de Janeiro in 2012.[28]

[24] http://www.childwatch.uio.no/
[25] http://www.childsrights.org/html/site_en/index.php?c=ins_pre
[26] http://www.earthchildinstitute.org/about-us
[27] http://powerofonechild.ning.com/
[28] http://www.peacechild.org/content.aspx?Group=ourwork&Page=ourwork_yc_prevcongress

Youth-led initiatives in CSD and UNFCCC

Youth are very active in many UN arenas, including the Commission on Sustainable Development and the Rio Conventions. The CSD Major Group for Children & Youth (MGCY) has built up a network of over 1000 youth leaders from hundreds of organizations. Usually around 30-80 youth participate in CSD sessions. In the weekend before each CSD, the MGCY organizes a Youth Blast to introduce newcomers to the CSD and to strategize together. The group works actively and coordinated in the CSD sessions as well as in between sessions, making use of online tools such as e-mail list servers, free Skype calls, Google documents, facebook, twitter, surveys, and online collaboration tools that allow multiple people to work on the same text in the same document at the same time over the internet.[29] The International Youth Climate Movement uses similar working methods in and between meetings with the UN Framework Convention on Climate Change. They also organize Conferences of Youth (COY) right before the COP. In 2009, the youth climate movement gained official constituency status with the UNFCCC on an interim basis, creating the Youth NGO constituency (YOUNGO). A final decision on the status will be made in time for COP17 in Durban 2011.[30]YOUNGO is an open space that consists of a dedicated group of individuals and youth NGOs committed to helping UNFCCC reach a fair, ambitious and binding global climate agreement. It is entirely run for and by youth and the initiative did not come from above but was created by young people.[31]

Youth active towards Rio+20

Those who were newly born when Agenda 21 was adopted in 1992 are now at the age of maturity and faced with a serious environmental, economic and social crisis. This new generation is actively preparing for the UNCSD 2012, wishing to hold governments accountable to decisions already taken, and contribute to the sustainable development agenda moving forward. The CSD Major Group for Children & Youth facilitates the official youth input to the Rio+20 process.[32]Rio+twenties is a youth-led, completely volunteer-based organization established to create a platform for active youth participation leading up to Rio.[33] Another youth initiative towards UNCSD is Peace Child International's Road to Rio+20, which aims to motivate, inspire, engage and support young people to take action on issues of sustainable development and influence the outcomes of Rio+20.[34]

Challenges and Conflicts

A divided Major Group — 'children' versus 'youth'

Young people are not one coherent group concerned with the same issues, but children have very different needs compared to youth. Children's voices need to be promoted by adults, while youth need to be given space and empowerment to organize themselves, lead and initiate action, rather than being patronized by adults. Children's issues tend to be forgotten and not given much space in position papers and statements by the Major Group for Children & Youth. On the other hand, children's issues are in general given higher status, more attention and more funding in the UN system.

Lack of unity between UNEP's two youth structures

Youth participation at UNEP gives the appearance of being fragmented. Since 2008 when UNEP adopted their new guidelines for Major Groups participation, there are in effect two youth groups

[29] http://www.youthcaucus.net/
[30] http://youthclimate.org/about_youth_climate/youngo-unfccc/
[31] UN Internal Voices magazine, 14th edition, 12 August 2011, page 30-31. http://youthclimate.org/files/2011/InternalVoicesArticle.pdf
[32] http://www.uncsd2012.org/rio20/index.php?menu=98
[33] http://rioplustwenties.org/?page_id=7
[34] http://www.roadtorioplus20.org/about

working formally with UNEP as representative of the youth constituency: The Children and Youth Major Group and the Tunza Youth Advisory Council, the latter being set up to be primarily liaising with the Outreach unit in UNEP's Divison of Communications and Public Information, and not with the UNEP Major Groups and Stakeholders Branch. This predicament becomes evident during UNEP Governing Council meetings, where Tunza Youth Advisors are treated to a parallel programme in which activities are organized 'for' youth and not 'by' youth. According to the Children and Youth Major Group at UNEP, this diverts their attention from the political decision-making process. This also has the consequence that the Children and Youth Major Group in UNEP is quite marginalised. Unity and understanding of approach at this organisational level should be sought.

Lack of institutional memory
Youth are not youth forever, which means there is a big rotation of members in the Major Group for Children & Youth, in other youth constituencies, and in youth organizations in countries. Youth who are active in an organization may stay for a few years, but then leave the group, and often bring their knowledge and experience with them so that new youth start from scratch. Many youth organizations have been criticized for not having a long-term vision or plan, and that their themes change with the changing leadership of their organizations. This can be an organizational necessity in order to maintain credibility as a youth group, and it can be refreshing and motivating for new youth to feel that they are free to come up with their new ideas rather than hold on to something old. Nevertheless it is a challenge for youth to not re-invent the wheel more than necessary.

Lack of funding
Neither children nor youth have much money of their own, and are therefore dependent on financial resources from others in order to carry out activities, participate in meetings and make their voices heard. One example is that it may be harder for Children & Youth than for others to follow intergovernmental processes, since many of the other Major Groups have paid staff who are involved in the UN as part of their daily job, while most youth have not yet entered the workforce in that field. Funding is needed for process work as well as for innovative projects run by young people for implementation of sustainable development.

Way Forward

Implement the World Programme of Action for Youth (WPAY)
It is still crucial to address the 15 priority areas contained in the World Programme of Action for Youth identified in 1995, by meeting the specific and measurable goals and targets for implementing the WPAY developed in 2005. As a first step, it would be useful to develop a set of verifiable indicators to complement the goals and targets. Once a fixed procedure for how to report on progress has been established, it is crucial to follow up.

Establish Sustainable Development Goals (SDG)
It has been suggested that UNCSD 2012 shall establish Sustainable Development Goals. Some of those should aim to support children and youth. As a priority, governments should incorporate investments in the education, health and employment of young people within development frameworks by 2015. This is important since young people constitute a large proportion of the population of developing countries and face disproportionate levels of poverty, unemployment, gender discrimination and health problems. Governments should support comprehensive policies,

youth participation and multisectoral programmes that empower present and future generations to fully and freely exercise their human rights, fulfill their aspirations and be productive citizens.[35]

Promote jobs for youth
Since there will be 500 million new job-seekers in the next 10 years, it is urgent to address the youth unemployment rate. The greening of cities, buildings, enterprises, agriculture, and other sectors could create a significant number of jobs for youth and disadvantaged groups, potentially alleviating unemployment issues while meeting other sustainability goals at the same time.

Encourage youth volunteering and non-formal education
There is a lot of potential in youth volunteerism and peer-to-peer education for sustainable development. This is recognized in Chapter 25 and has proven very successful in cases that have taken place. Non-formal education, youth campaigns and youth-led training courses for sustainable development deserves much more support in the coming years.

More youth representatives on national delegations
Delegations to intergovernmental meetings should invite youth to participate as official representatives. Those delegates should be selected by youth themselves. More governments should also organize meetings with youth on the national level to collect their ideas before important UN negotiations, and involve them in the full cycle of national sustainable development governance.

Give Children more space in the Major Groups model
As long as Children & Youth belong to the same Major Group, youth should make an effort to involve the views of children as well. It has sometimes been suggested that issues concerning children would be better addressed if they were not clustered together with youth. One possibility could be to have aseparate Youth Major Group and include Children's issues inthe Women's group, since gender issues and child care are closely connected.

Establish a co-managed UN Youth Agency
While UNICEF is the UN agency responsible for children, there is no institutional presence on the same level for youth. There is a need for a stronger youth institution that could bring the energy of youth to the heart of the UN system. This could be created in the form of an expanded UN Programme on Youth in DESA, or a Secretariat could be established for the Inter-Agency Network on Youth Development (IANYD). Alternatively, a UN Youth umbrella body could be formed to do for youth what UN Women is doing for women, or a fully-fledged specialized agency for youth could be established. Regardless of the option chosen, the institution should importantly be co-managed by youth, in the sense that there would be a majority of youth staff and volunteers working alongside professional UN staff as equal partners. The youth staff would be hired on short-term contracts of 1-2 years, with the possibility of extension and promotion to full-time paid positions as they prove commitment and capacity. The role of the institution would be to raise funds for youth participation and youth-led development actions, to create synergies and avoid duplication, and to promote and deliver information on UN activities and opportunities to youth on the local level in all parts of the world. The youth institution could also act as an Ombudsman for Future Generations.

[35]Declaration of the 64th Annual UN DPI/NGO Conference, Bonn, Germany, 3-5 September 2011.

Chapter 26: Recognizing and Strengthening the Role of Indigenous People and Their Communities

Introduction

Indigenous peoples are the inheritors and practitioners of unique cultures. Despite the cultural differences between the more than 370 million indigenous people in some 90 countries worldwide, the various groups share common problems related to the protection of their rights as distinct peoples. Indigenous peoples have retained special interconnectedness with nature, and their social, cultural, economic and political characteristics are distinct from those of the dominant societies in which they live.At the core of their existence is the spiritual and material relationship with their ancestral lands and territories, waters and other resources. Agenda 21 recognizes that indigenous peoples must be accepted and acknowledged at the national, regional and international level, and their traditional knowledge must be respected, promoted and protected. This is central to the achievement of human and environmental sustainability.

Indigenous peoples have a long history of mobilizing together on the global level. At the United Nations, indigenous delegates appeared in 1977 to speak "on behalf of those that do not have a voice" – nature and the future generations, and to protest against the destruction of their territories, resources and cultures.[1] In 1982, an ECOSOC decision established the United Nations Working Group on Indigenous Populations (WGIP).[2] When indigenous groups started lobbying the UNCED process a decade later, their primarygoal was not to get a separate chapter on indigenous peoples, but to ensure that all chapters of Agenda 21 would include perspectives and issues relevant to indigenous peoples. This resulted in indigenous concerns being mentioned in several paragraphs throughout the text. However, it is a major weakness from the indigenous perspective that Agenda 21 and other Rio documents still operate within the framework of the dominant development paradigm, instead of questioning the economic growth model as the main reason for environmental degradation.[3]

Indigenous peoples prepared thoroughly for UNCED, organized their own preparation conferences and participated in the UN hosted ones.[4]The inclusion of Indigenous People and their Communities as one of the Major Groups through Chapter 26 was important, since it brought indigenous peoples into the whole sustainable development discourse. Interconnectedness with the surrounding environment has always played and important role in the lives of indigenous peoples, and the concept of sustainable development exonerated and legitimized their holistic view of the world. Indigenous peoples in local communities have taken the thematic challenges found in Agenda 21 seriously, and responding positively to the call in Chapter 26, representatives from these communities have continuously engaged in the international processes on sustainable development since UNCED. In 2002,more than a hundred indigenous representatives from over 30 countries participated in the World Summit on Sustainable Development. Since then an average of 4-6 persons from the indigenous peoples' major group have been taking part in the annual meetings of the Commission on Sustainable Development, coming from 4-6 countries, usually from Asia, Africa, and the Americas. The number of participants has depended on the

[1]Muehlebach, Andrea (2001). *"Making Place" at the United Nations: Indigenous Cultural Politics at the U.N. Working Group on Indigenous Populations.*Cultural Anthropology, Vol. 16, No. 3, pp. 415-448.
[2]http://www.un.org/esa/socdev/unpfii/en/history.html
[3]Tauli-Corpuz, Victoria (1996).*The Implementation of Agenda 21 and Indigenous Peoples.*http://www.un-ngls.org/orf/documents/publications.en/agenda21/02.htm
[4]http://www.culturalsurvival.org/publications/cultural-survival-quarterly/brazil/indigenous-peoples-after-unced

support granted by donors or the UN itself, and the funds are usually earmarked and limit representation to peoples from the South.

A major accomplishment at the Johannesburg World Summit on Sustainable Development was the official addition of an “s” to the term “indigenous people”. This gave the UN a consistent policy in using the term "indigenous peoples”, which is a milestone recognition of high significance. Adding the “s” affirms that ‘indigenous peoples’ are peoples who have the right to self-determination. Paragraph 25 in the Johannesburg Declaration on Sustainable Development states "We reaffirm the vital role of indigenous peoples in sustainable development".[5]

Implementation

International implementation

Chapter 26 called for the United Nations system and other international organizations to take measures to strengthen their work on indigenous peoples and their communities. Today many of the old UN agencies and programmes have indigenous peoples as a specific target, and some have adopted policies or guidelines on indigenous peoples.In addition, several new formal mechanisms on indigenous peoples have been established in the UN system since UNCED. Some of them have been put in place through parallel processes rather than as a direct result of Agenda 21, but the outcome of UNCED strengthened and supported a development in this direction. Many of the new structures work in line with Chapter 26 implementation as they contribute towards thegoals mentioned there.Here is an overview:

UN Permanent Forum on Indigenous Issues (UNPFII)

In July 2000, the UNGA established a UN Permanent Forum on Indigenous Issues (UNPFII) as a subsidiary organ and advisory body to ECOSOC.[6] The UNPFII has 16 members of which indigenous peoples’ organizations nominate eight and governments eight.[7]The Permanent Forum is mandated to discuss indigenous issues related to economic and social development, culture, the environment, education, health and human rights. It holds annual two-week sessions that usually and by default take place in the UN Headquarters in New York.[8]UNPFII has contributed significantly to the goals in Agenda 21 Chapter 26 by increasing awareness of indigenous peoples’ issues and by providing a high-level forum in which their voices can be heard. The Permanent Forum has also promoted the inclusion of indigenous peoplesin other development agendas, such as the process linked to the Millennium Development Goals.[9]

Inter-Agency Support Group on Indigenous Issues (IASG)

Agenda 21 paragraph 26.5 (a) called for the appointment of a special focal point for indigenous peoples within each international organization, as well as annual interorganizational coordination meetings.[10]In 2002, governments established an Inter-Agency Support Group on Indigenous Issues (IASG)to meet annually with the task to promote and support the mandate of UNPFII within the UN system. The mandate was later expanded to support indigenous related mandates throughout the entire intergovernmental system. IAGS is now composed of 34 UN system agencies, programmes, funds and other intergovernmental organizations.[11] The annually rotating

[5] http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/POI_PD.htm
[6] UNPFII (2010).*Training Module on Indigenous Peoples’ Issues,Facilitator’s Handbook.* http://www.un.org/esa/socdev/unpfii/documents/trainingmodule_en.pdf
[7] http://www.un.org/esa/socdev/unpfii/en/members.html
[8] http://www.un.org/esa/socdev/unpfii/en/about_us.html
[9] http://www.un.org/esa/socdev/unpfii/en/mdgs.html
[10] http://www.un.org/esa/dsd/agenda21/res_agenda21_26.shtml
[11] UNPFII (2010).*Training Module on Indigenous Peoples’ Issues,Facilitator’s Handbook.* http://www.un.org/esa/socdev/unpfii/documents/trainingmodule_en.pdf

Chairmanship has been held by among others the ILO, UNDP, UNICEF, WIPO, and the World Bank.[12]

Special Rapporteur on the rights of indigenous peoples

A Special Rapporteur on the situation of human rights and fundamental freedoms of indigenous peoples was appointed in 2001 and is now placed under the Human Rights Council. Dr. Rodolfo Stavenhagen from Mexico held the mandate from 2001-2008, and the Special Rapporteur since 2008 is Prof. S. James Anaya from the USA. The Special Rapporteur investigates specific situations and cases for indigenous peoples in different parts of the world, produces country reports, promotes good practices, and addresses cases of alleged violations of the rights of indigenous peoples.[13]

Expert Mechanism on the Rights of Indigenous Peoples (EMRIP)

In 2007, an Expert Mechanism on the Rights of Indigenous Peoples (EMRIP) was added as a subsidiary body under the Human Rights Council. EMRIP is composed of five independent experts on the rights of indigenous peoples.[14] Their mandate is to conduct studies and research on issues and topics of general concern for indigenous peoples worldwide. Based on this, they also provide well-grounded, independent and constructive thematic advice and proposals on indigenous rights to the Human Rights Council. The first studyfocused on the right to education for indigenous peoples and was completed in 2009. EMRIP is currently working on a study and accompanying advice on indigenous peoples' right to participate in decision-making, which is a goal emphasized in several paragraphsin Chapter 26 of Agenda 21.

Declaration on the Rights of Indigenous Peoples

Agenda 21 paragraph 26.4 (a) encouraged governments to provide support for the adoption of a declaration on indigenous rights. The work towards such a declaration had started more than a decade before UNCED, butthe process moved very slowly. States expressed concerns about some of the core provisions of the draft declaration, namely indigenous peoples' right to self-determination and the control over natural resources existing on the traditional lands of indigenous peoples. Finally in 2007, the UN General Assembly adopted the Declaration on the Rights of Indigenous Peoples, with a majority of 144 member states voting in favor. The four countries that voted against were Australia, Canada, New Zealand and the United States, but theyhave all reversed their positions and endorsed the Declaration by now. 11 abstentions were received from Azerbaijan, Bangladesh, Bhutan, Burundi, Colombia, Georgia, Kenya, Nigeria, Russian Federation, Samoa and Ukraine, out of which Samoa and Colombia are now in support of the Declaration.[15]

International Decades for the World's Indigenous Peoples

After lobbying by indigenous peoples, the United Nations declared 1993 as the International Year of the World's Indigenous People. Subsequently, an International Decade of the World's Indigenous People was celebrated 1995-2004.[16] In 2004 it was concluded that the decade had failed to achieve its main goal and objectives, especially in relation to national level human rights measures, and since there was still no international declaration on indigenous peoples rights.[17] As the needs for this were strong, the General Assembly announced a Second International Decade

[12] http://www.un.org/esa/socdev/unpfii/en/iasg.html
[13] http://www2.ohchr.org/english/issues/indigenous/rapporteur/index.htm
[14] http://www.ohchr.org/EN/Issues/IPeoples/EMRIP/Pages/Membership.aspx
[15] http://www.un.org/esa/socdev/unpfii/en/declaration.html
[16] http://www.un.org/rights/indigenous/mediaadv.html
[17] UNGA (2010). *Midterm assessment of the progress made in the achievement of the goal and objectives of the Second International Decade of the World's Indigenous People.* Report of the Secretary-General.A/65/166.http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N10/463/06/PDF/N1046306.pdf?OpenElement

of the World's Indigenous People 2005-2014.[18] The overall goal of the ongoing Second Decade is"further strengthening of international cooperation for the solution of problems faced by indigenous peoples in areas such as culture, education, health, human rights, the environment and social and economic development by means of action-oriented technical assistance and relevant standard-setting activities".[19]

National and regional implementation

Cooperation at the regional level

Agenda 21, paragraph 26.6 (b) encourages governments to cooperate at the regional level to address common indigenous issues with a view to recognizing and strengthening their participation in sustainable development.[20] This is of particular importance to indigenous peoples whose traditional lands andterritories are under the jurisdiction of several States. Some examples of regional forums that have included indigenous peoples' issues in their formal political agendas are the Arctic Council, the Central American Integration System, the Andean Community, and the Caribbean Community and Common Market. Another positive example of regional cooperation on indigenous issues is the work of the African Commission on Human and Peoples' Rights, and its Working Group on Indigenous Population/Communities in Africa. During the negotiations on the intergovernmental Declaration on the Rights of Indigenous Peoples, the Commission played a crucial role by facilitating dialogue among African States that increased their understanding of the Declaration's provisions. However, implementation of the declaration is still lacking on the national level.[21]

National government action and recognition of indigenous peoples

On the national level, progress in implementation of Chapter 26 has been uneven. Since UNCED, many States with indigenous populations have taken measures to strengthen their status and participation in legislation and political systems. Others do still not even acknowledge the presence ofindigenous peoples in their countries.[22]A recent example is the official recognition in 2009 by the Government of Japan of the Ainu people as the indigenous people of Japan. In 2008, the Governments of Australia and Canada issued national apologies for past assimilation policies systematic abuse of the human rights of indigenous children.

Indigenous peoples in national parliaments

In 2009, the Inter-Parliamentary Union (IPU) in collaboration with the United Nations Development Programme (UNDP) conducted a survey of national parliaments on the inclusion of indigenous peoples and minorities in national level decision-making. Representation in parliaments is essential for ensuring effective participation by these groups in public affairs. 91 countries responded to the survey that was distributed to all national parliaments. 40 percent of the respondents stated that some sort of special electoral measures for indigenous and/or minority groups are in use in their country.

[18]UNGA Resolution A/RES/59/174
[19]http://www.un.org/esa/socdev/unpfii/en/second.html
[20] Agenda 21 Chapter 26
[21]UNGA (2010). *Midterm assessment of the progress made in the achievement of the goal and objectives of the Second International Decade of the World's Indigenous People.* Report of the Secretary-General.A/65/166.http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N10/463/06/PDF/N1046306.pdf?OpenElement
[22]UNGA (2010). *Midterm assessment of the progress made in the achievement of the goal and objectives of the Second International Decade of the World's Indigenous People.* Report of the Secretary-General.A/65/166.http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N10/463/06/PDF/N1046306.pdf?OpenElement

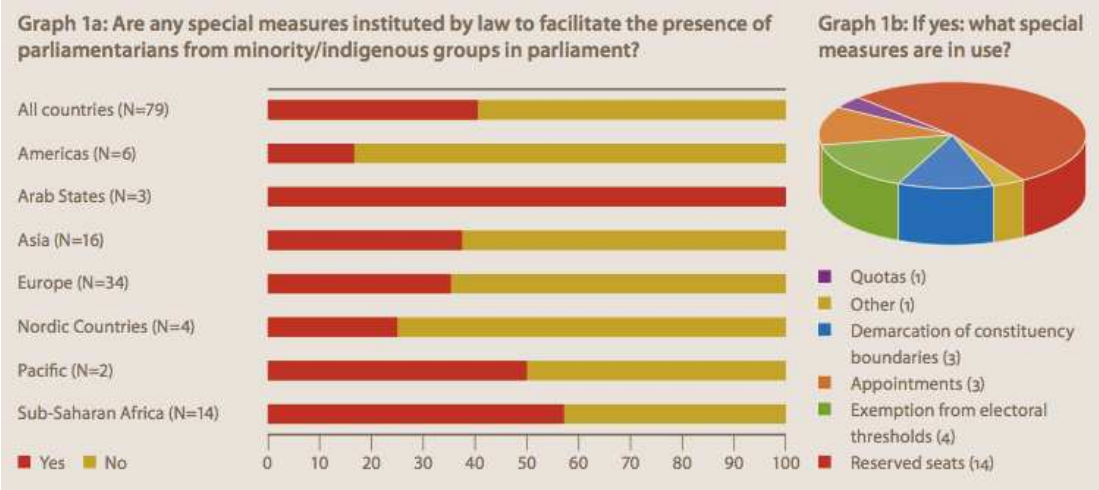


Figure 1. Special electoral measures
Source: IPU and UNDP, 2010.

56 percent responded that their parliament has a specialized body for addressing indigenous and/or minority matters. In some cases this may refer to a body with a broader human rights mandate, which includes focusing on indigenous peoples' rights. The result points to a degree of institutionalization of indigenous issues in many countries. A lower percentage, 32 percent, reported that their parliaments has some sort of obligation to consult with indigenous or minority groups.[23]

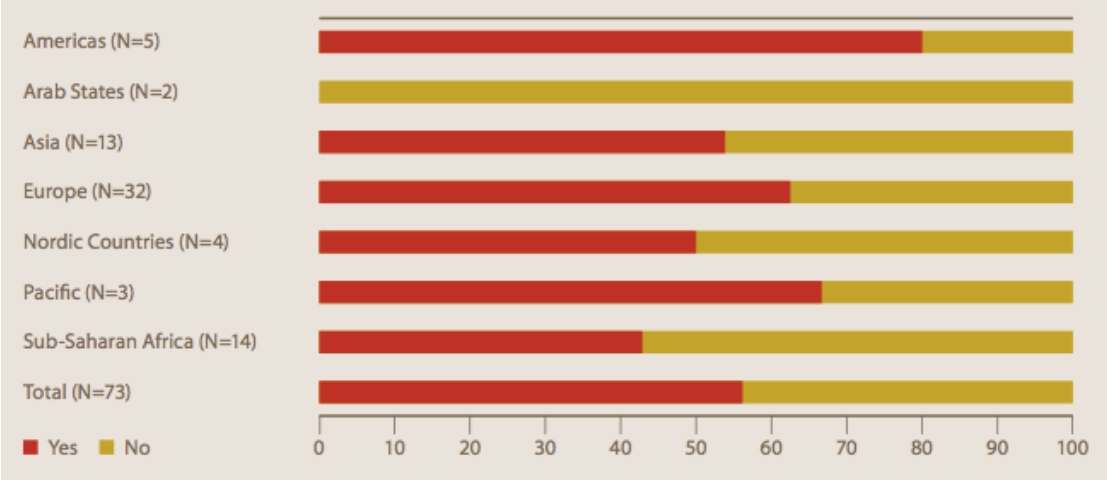


Figure 2. Parliamentary bodies on minority and indigenous issues
Source: IPU and UNDP, 2010.

Alternative indigenous parliaments
In some countries, indigenous peoples have their own decision-making bodies that are recognized and taken into account to various degrees by national governments. The arrangements depend on different historical, legislative and cultural circumstances, and it differs to what extent self-governance is aspired. For example, in Sweden there is a parallel indigenous parliament that is funded and controlled by the Swedish government. It is limited to monitoring government rather

[23] Protsyk, Oleh (2010). *The representation of minorities and indigenous peoples in parliament. A global overview.* IPU and UNDP.

than acting as an instrument for self-governance.[24] In the USA, the National Congress of American Indians (NCAI) is an independent advocacy body, financially independent and located outside of government, but having active dialogues on policy developments and monitoring government.[25] In New Zealand, the principal government advisor on policy and legislation regarding the Maori is non-representative government body, the Ministry of Maori Development (TPK).[26] Russia saw the establishment in 2008 of the First Congress of the Sami People of the Murmansk Region, aiming to represent indigenous peoples in regional governments in the northern and far-eastern regions of the Russian Federation, as well as in Inter-Arctic conferences.In a few instances, States have reported that indigenous peoples' political parties have been established, as in Ecuador and Nepal.

Law for indigenous rights

The Declaration on the Rights of Indigenous Peoples is being referred to and used in courts of law in some countries. The concept of "interculturality" can be useful to apply as an instrument for changing the relationships between indigenous and non-indigenous populations. Latin America has come further than other world regions in defining and using it within the state and in national policy-making, and the Declaration has become an integral part of constitutional reform processes. Bolivia adopted the Declaration as national law in 2007. In 2009, a new Self-Government Act for Greenland was promulgated "in accordance with the right of self-determination of the people of Greenland under international law".[27]

The use of indigenous languages

Access to information in indigenous peoples' languages needs to increase in order to promote the effective participation of indigenous peoples. Such information is often not available even on the national level, since only a few States have a systematic use and recognition of indigenous languages. Some states in Scandinavia and in South America have declared indigenous languages to be official national languages. Public service, information from the government and primary education is then made available in the indigenous languages, which is very valuable for those who have it as their mother tongue.

Major groups implementation

Indigenous peoples around the world have come together and formed organizations to promote their rights. Local organizations are often associated with particular groups or tribes, but quite commonly many such organizations join together in national or regional organizations. Those in turn may join international umbrella organizations that are open to work with indigenous peoples from around the world, not limited to a particular area or culture. Many indigenous peoples who belong to local organizations identify with a global movement for indigenous peoples' rights. Indigenous peoples organizations for environment and sustainable development have also been established.

The CSD Organizing Partners for the Indigenous Peoples Major Group come from the Indigenous Peoples' International Centre for Policy Research and Education (Tebtebba)[28] and the Indigenous Environmental Network (IEN)[29]. The current indigenous representatives in the UNEP Major Groups Facilitating Committee come from the Asia Indigenous People's Pact[30] and the

[24] http://www.eng.samer.se/servlet/GetDoc?meta_id=1103
[25] http://www.ncai.org/About.8.0.html
[26] http://www.tpk.govt.nz/en/
[27] Greenland Act No. 473 of 12 June 2009.
[28] http://www.tebtebba.org/
[29] http://www.ienearth.org/
[30] http://www.aippnet.org/home/index.php

Indigenous Peoples of Africa Coordinating Committee (IPACC)[31]. Some other examples of international organizations open to all indigenous peoples are the International Work Group for Indigenous Affairs (IWGIA)[32], the World Rainforest Movement (WRM)[33], the Center for World Indigenous Studies (CWIS)[34], Minority Rights Group International (MRG)[35], among others. Many indigenous organizations are included in the ECOSOC Civil Society Network.[36]

Indigenous groups organize themselves to advocate for their full and effective participation in activities on the international agenda that concern or affect them. This is evidenced for example by the climate change regime, in which indigenous peoples engage in UNFCCC sessions, REDD meetings, etc. For example, in April 2009 the Indigenous Peoples' Global Summit on Climate Change adopted the Anchorage Declaration.[37]

Challenges and Conflicts

Living conditions still worse for indigenous peoples
Although many targeted initiatives have been launched since 1992 for improving the livelihoods of indigenous peoples, there is still a long way to go. The scale of the projects does not reflect the severity of the situation. Indigenous peoples constitute approximately 5 per cent of the world's population. Yet they make up no less than 15 per cent of the world's poor, including about one third of the 900 million extremely poor rural people in the world.[38]

Lack of intercultural understanding
International normative tools, such as the Declaration on the Rights of Indigenous Peoples, encounter great challenges on the national level in the implementation phase. A fundamental barrier to the application of an intercultural focus in national policies and programmes is the lack of technical knowledge among civil servants. Strong efforts to sensitize and educate all sectors of society about "interculturality" would be required.

Lack of indigenous participation in national policy
Indigenous peoples, and in particular indigenous women, lack both direct political participation and indirect recognition in the politics of many countries. This applies to many regions. In Africa, indigenous peoples' collective claims on land and natural resources are commonly denied, often because indigenous peoples are not recognized as right holders or at all.[39]In the Asian and Pacific region, only a handful States have officially recognized the existence of indigenous peoples in their countries, although the region is home to about 70 percent of the world's indigenous people. The political participation of indigenous peoples is very low in most national legislative processes in Asia-Pacific.

[31] http://www.ipacc.org.za/eng/default.asp
[32] http://www.iwgia.org/
[33] http://www.wrm.org.uy/
[34] http://cwis.org/
[35] http://www.minorityrights.org/
[36] http://esango.un.org/irene/?page=search&str=indigenous&type=9
[37] http://www.indigenousportal.com/Climate-Change/The-Anchorage-Declaration.html
[38] UNGA (2010). *Midterm assessment of the progress made in the achievement of the goal and objectives of the Second International Decade of the World's Indigenous People*. Report of the Secretary-General.A/65/166.http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N10/463/06/PDF/N1046306.pdf?OpenElement
[39] ILO/ACHPR (2009).*Overview Report of the Research Project by the International Labour Organization and the African Commission on Human and Peoples' Rights on the constitutional and legislative protection of the rights of indigenous peoples in 24 African countries.*http://www.ilo.org/indigenous/Resources/Publications/lang--en/docName--WCMS_115929/index.htm

Indigenous issues kept separate from other agendas
Indigenous points of view, concerns and expertise should be integrated into all the work of the United Nations and not limited to issues identified as 'indigenous'. Indigenous peoples have ancient and practical knowledge on sustainable development and environment, but often feel that there is no opportunity for true sharing. Indigenous peoples want to be included with a central role as respected partners, rather than just discuss issues concerning their rights or to fill a minority quota without genuine inclusion.

Missing: Dispute resolution mechanism
Indigenous peoples often find themselves involved in conflict with the dominant society, mostly relating to the loss of their lands, territories and resources. It may also have to do with the deprivation of their civil, political, cultural, social and economic rights. The rapid pace of globalization has accelerated such conflicts and indigenous peoples, like all other peoples, need access to mechanisms for peaceful conflict resolution. The International Court of Justice (ICJ) or the United Nations system does not provide legal standing or juridical mechanisms for conflict resolution between indigenous individuals or collectives against States and others.

Dominant worldview undermining indigenous concerns
Indigenous peoples live in a harmonious relationship with their natural surroundings. When it comes to Agenda 21 and sustainable development, from the indigenous peoples' perspective, the major weakness is that the Rio documents still operate within the framework of the dominant development paradigm. The common worldview that does not question economic growth is a major cause of environmental degradation.

Way Forward

Improve the situation for indigenous peoples
In a midterm assessment of the Second International Decade of the World's Indigenous People, the following actions were recommended for improving the situation for indigenous peoples in the coming years:

- The UN system, Member States and indigenous peoples worldwide should work continuously for the full application and operationalization of the UN Declaration on the Rights of Indigenous Peoples.
- Member States who have not yet done so need toinitiate steps to recognize the indigenous peoples in their countries.
- Member States are recommended to establish national legislative frameworks for indigenous peoples' individual and collective rights, and to develop institutional policies and mechanisms so as to engage effectively on indigenous peoples' issues, taking as a point of reference the provisions of the UN Declaration on the Rights of Indigenous Peoples.
- Increased funding, mainstreaming and upscaling of successful programmes on indigenous peoples' issues are urgently required in order to achieve the Millennium Development Goals also for the world's indigenous peoples.
- The creation of special national committees on the Second Decade of the World's Indigenous People should be considered in order to promote the implementation of its goal and objectives more effectively.[40]

[40]UNGA (2010). *Midterm assessment of the progress made in the achievement of the goal and objectives of the Second International Decade of the World's Indigenous People.*A/65/166. Page 19.

Mainstream indigenous values

Indigenous peoples' cultures contain a lot of wisdom for sustainable living that is urgently needed in the wider world today. By embracing and implementing ancient indigenous ideas, including a worldview of holism and interconnectedness, the international community would get guidance for steering on course. For example, unsustainable land management is an emerging issue that must be resolved in order to feed the growing global population. Land is of crucial importance to indigenous peoples, and by respecting their values and learning their effective and inclusive governance approaches, land management would become more sustainable. This has to be supported by an economic system that values natural resources appropriately, in order to reduce resource depletion and ecosystem degradation. This could become possible if development is understood in a different way, as promoted by indigenous peoples.

Recognize the rights of Mother Earth

For sustainable development to become reality, humanity needs to live in more harmony with nature and recognize the rights of Mother Earth. On 20 April 2011, the UN General Assembly held an interactive dialogue on harmony with nature. There is an emerging recognition of the need to examine how humans can better reconnect with the world around them through a holistic understanding of sustainable development with an ecosystem and human rights based approach to development. In line with an indigenous worldview, the UN Conference on Sustainable Development in 2012 could reaffirm harmony with nature and rights of Mother Earth.

Chapter 27: Strengthening the Role of Non-Governmental Organizations – Partners for Sustainable Development

Introduction

Over the last decades, the importance of non-governmental organizations (NGOs) in global governance has increased tremendously. Today, the UN and its agencies have grown dependent on NGOs to implement UN resolutions and goals, in a mutually beneficial relationship.

NGOs have been recognized actors throughout the entire history of the United Nations, but in the beginning it was mainly a few large international NGOs that were involved in a formal and ceremonial relationship with the UN rather than in terms of political pressure. In the 1990's, the NGO involvement in the UN changed profoundly both quantitatively and qualitatively. The UN organized big world conferences, UNCED included, on topics that NGOs found important and got motivated to participate in. This marked a turning point, with national and regional NGOs engaging in intergovernmental deliberations and seeking to influence their outcomes directly as well as through advocacy and mobilization. A number of NGOs started to prepare for UNCED and were active both in the formal UN arena and in parallel NGO events. Consequently, Chapter 27 of Agenda 21 is devoted to strengthening the role of NGOs as "partners for sustainable development". Agenda 21 establishes a general presumption that the role of NGOs in international organizations and treaty systems should be strengthened further. The 'Second Generation' of UN-NGO relationships was born.[1]

The legal basis for NGO participation at the United Nations is Article 71 of the UN Charter, which allows ECOSOC to entertain consultative relationships with NGOs. In 1968, the UN General Assembly agreed on Resolution 1296, which became the most authoritative statement determining the official criteria on the role of NGOs when they participate in UN processes. In addition, separate rules on accreditation govern who gets access to various UN venues.[2]The UN Charter recognizes NGOs, International Organizations and Governments as the only three categories of legitimate actors in the UN. The way for all the nine Major Groups to be involved in the UN system is therefore through their own NGOs, and Agenda 21 Chapter 27 on NGOs is directly relevant to all the Major Groups as a result.

"Non-governmental organizations" is a strange concept since it only talks about what something is not, without defining what it is. There are very many different attempts to define NGOs, but no single definition has been universally agreed. Scholars have tried to categorize NGOs on the basis of what issues they deal with, what sector of society they come from, what target group they have, etc. Some have tried to introduce alternative terms for the concept, such as civil society organizations (CSOs), not-for-profit organizations, voluntary or ideological organizations. Some debated cases are when so-called NGOs include governments or government officials as members or derive funding from governments.

Regardless of the definition used, it is always the case that the spectrum of NGOs is very diverse. Different NGOs have different purposes, structure, geographical scope, size, resources, and functions. This rich diversity is positive and brings many opportunities. The fact that governments, and often the UN, want NGOs to be coordinated and speak as one group has been

[1]Hill, Tony (2003). *Three Generations of UN-Civil Society Relations: A Quick Sketch.* NGLS, United Nations Non-Governmental Liaison Service.
[2]http://www.un-ngls.org/orf/documents/publications.en/agenda21/01.htm

increasingly fought by the civil society community. The concept of the nine major groups as established and decided by Agenda 21 was an effort to allow for formal diversity in the NGO community at the UN. During the first decade of CSD (1992-2002) the major groups felt often forced to act as one group. In the second decade – 2003 until present, governments and the UN have often allowed each of the nine major groups to speak separately at UN plenary meetings.

Implementation

International implementation

Changes to the UN rules for NGO involvement in 1996

In 1993 it was agreed that resolution 1296 (XLIV), which had regulated the role of NGOs in the UN system since 1968, needed to be reviewed and updated in light of Agenda 21 and developments in the world. The work of an Open-Ended Working Group on the Review of Arrangements for Consultations with NGOs established by the ECOSOC led to the adoption of Resolution 1996/31 as the formal legal framework for UN-NGO relations. This resolution set out the currently valid participation rights for NGOs.[3] It envisages far-reaching participatory opportunities for national and international NGOs within ECOSOC and its Functional Commissions, such as the Human Rights Commission and the Commission on Sustainable Development (CSD). The resolution details the participation of NGOs in international UN conferences. It makes it explicitly possible for national and regional NGOs to apply for consultative status with the UN, while previously only international NGOs could be formally invited.

Cardoso Report in 2004

Chapter 27 tasked the international system to report on ways to enhance NGO contributions to UN decision making, and to review UN financial and administrative support to NGOs with a view to augmenting their role. Spurred by UNCED and Agenda 21, NGO activity increased in the 1990s both at the implementation level in the field and at the intergovernmental policy level. The NGO activity also held a high profile through the 2002 Johannesburg Summit. In 2003 Kofi Annan, then UN Secretary-General, established a Panel of Eminent Persons on United Nations - Civil Society Relations, tasked with recommending changes in the UN system aiming to make it easier for NGOs to contribute. The panel reviewed the existing practices and procedures for NGO participation throughout the UN system. The panel's report, entitled "We the Peoples – civil society, the United Nations and global governance" and commonly referred to as the Cardoso Report, covered a range of issues and offering 30 proposals for improved UN-NGO relationships. [4] The Cardoso Report was presented to the 58th Session of the UNGA, and the Secretary General backed it up with a report to the 59th UNGA in 2004. After that, the Brazilian government in particular made several attempts to get the recommendations adopted by a resolution, but because of formal issues raised by some member nations, the report was never passed.

Although the panel's recommendations have not been formally adopted, many of them have in some form or another contributed to increased engagement between the UN and the NGO community. For example, a Trust Fund has been established to support country teams of the UN to work with civil society. However, most of the proposals presented in the Cardoso Report, as

[3] http://www.un.org/documents/ecosoc/res/1996/eres1996-31.htm

[4] United Nations (2004, June 11). *We the Peoples: Civil society, the United Nations and global governance.* A/58/817. Retrieved from http://daccess_dds_ ny.un.org/doc/UNDOC/GEN/N04/376/41/PDF/N0437641.pdf?OpenElement

well as the ones promoted by the Secretary General in his follow-up report, have not been implemented.[5]

New procedures and participation models for NGOs

Paragraph 27.9b calls for enhanced procedures of all UN agencies to include the views of NGOs. The procedures for NGO participation varies a lot throughout the UN system, with UNEP and CSD using the Nine Major Groups as the basis for their management model, and other UN bodies having NGO constituencies involved in a range of ways. It is clear that Agenda 21 served as a trendsetter and source of inspiration for UN agencies to reach out and involve NGOs beyond the closest reach. More parts of the system recognize the advantages and possible gains of partnering with NGOs and inviting them to contribute. Below are some different models described and exemplified.

NGO involvement in the UNGA and Security Council

The UN General Assembly (UNGA) has no direct formal or legal framework for NGO participation, but in practice opened up to NGOs in recent years. Non-state actors participated in the Rio+5 Conference in 1997 hosted by the UNGA, as well as in other Special Sessions. In line with the Cardoso Report recommendations, the UNGA hosted informal Civil Society Hearings in the run up to the 2005 World Summit and beyond. The UN Security Council does not formally allow NGO participation, but a protocol trick – the so-called Arria Formula – enables individual consultations with NGOs to take place. These have been held outside the Security Council premises and do not appear on the official Council Agenda.

NGOs in the Rio Conventions and other Multilateral Environmental Agreements

The three so-called Rio conventions and other multilateral environmental agreements (MEAs) adopted in the context of UNCED or later contain specific references to NGOs, in line with the call from Agenda 21 to involve NGOs extensively. Most of them explicitly require their Conference of the Parties (COP) to utilize information provided by competent NGOs and to seek cooperation from NGOs in the implementation of relevant agreements. At UNFCCC COP-15 in Copenhagen in 2009, NGOs were allowed to host side-events and show exhibitions, and even carry out restricted actions and media stunts inside the UN conference centre. Many observed however that this openness only served to give the COP a thin veneer of participatory practices. Most members of the NGO community viewed the entire process at COP 15 as a huge step back in terms of transparency, access and participation, since all the formal elements of the COP process were closed to civil society.

NGOs in International Economic Institutions

For the majority of the international economic institutions (IFIs), such as the World Trade Organization (WTO), the World Bank, and the International Monetary Fund (IMF), formal participation by NGOs is limited to observer status. The IFIs did not make any significant changes in their participation systems in light of Agenda 21. NGO movements have been active critics of some practices by the World Bank and IMF, such as structural adjustment programmes, but there is no formal participation for NGOs in any aspect of their decision-making.[6] In 1999, almost 750 NGOs were accredited to the WTO's Ministerial in Seattle, and 647 were accredited to the Doha Ministerial in 2001.[7]

[5] http://www.un-ngls.org/spip.php?page=article_s&id_article=796
[6] Friends of the Earth International's Greening the IMF campaign http://www.foe.org/international/imf/.
[7] WTO website http://www.wto.org/english/forumse/ngoe/ngoinseattlee.htm; http://www.wto.org/english/news_e/pres01_e/pr240_e.htm

Utilization of information and communication technology

A significant change that has taken place in the world since UNCED, and which has significantly changed the conditions and opportunities for NGO participation in the UN, is the increased use of information and communication technologies (ICT). Internet and online services have supported broad-based participation from a distance, since it has become much easier for international organizations to make information instantly available to large constituencies. Websites and e-mails are used daily, feedback can be submitted and formal consultations can be run this way. A growing number of UN agencies are using social media tools such as Facebook and Twitter as additional channels to connect with NGOs and the public.

Aarhus Convention

The Aarhus Convention in Europe is an example of a regional treaty that has enabled the enhancement of NGO participation in environmental governance. The Aarhus Convention -- its full name is the 'Convention on Information, Public Participation in Decision-making and Access to Justice in Environmental Matters' -- entered into force in 2001, and has 44 Parties in 2011. It represents enforceable binding national law in most member states of the European Union (EU), and since 2007 all institutions, bodies and agencies of the EU are also bound to comply with its provisions. The Convention with its three pillars (access to information, public participation in decision-making, access to justice in environmental matters) is designed to improve the way governments and decision-makers engage with the public on environmental matters. It helps ensure that environmental information is easy to get hold of and easy to understand, and that there are channels for people's voices to get heard and considered in environmental decision-making for sustainable development. As such, it has potential to provide socially excluded communities with the tools they need to challenge and influence decisions to avoid environmental degradation.[8] The 'Access to Justice' section is perceived as the weakest pillar of the Aarhus Convention, since it is still difficult and uncommon for individuals and smaller NGOs to initiate and win environmental cases in courts. Only large NGOs with significant financial resources are able to take the risk of loosing a case. However, the Aarhus Convention is regarded a success in general. It has developed a threshold of good practice regarding access to information and public participation, which is especially significant in new EU member states where such practices did not exist before.[9]

NGO networks active in Agenda 21 implementation

NGOs all over the world have responded proactively to Agenda 21 and have since UNCED played an important role in implementation of its various chapters. This work takes place on all scales, in local grassroots communities as well as through global campaigns. Large NGO networks have formed around various sustainable development issues, and although some of this may have happened without Agenda 21, it is clear that UNCED inspired a lot of it.

Sustainable Consumption and Production was quickly adopted by NGOs as a major concern, and led to the establishment of many other organisations. For example, the Partnership for Education and Research about Responsible Living (PERL), and its predecessor the Consumer Citizenship Network, today consist of over 130 institutions in 50 countries.[10]

Taking the content of Chapters 19, 20, 21 and 22 seriously, several NGO networks were established to work on chemicals and waste. IPEN, the International POPs Elimination Network (IPEN) was launched in June 1998 to reduce and eliminate toxic chemicals by working for sound

[8] http://live.unece.org/env/pp/welcome.html
[9] http://www.capacity.org.uk/resourcecentre/article_aarhaus.html
[10] http://www.perlprojects.org/Project-sites/PERL/About-PERL/Who-we-are

policies and implementing them on the ground, and today more than 700 Participating Organizations in 100 countries make up the network.[11] The Basel Action Network (BAN) is another NGO civil society network following the work of a UN convention that came out of Agenda 21.[12]

Stakeholder Forum for a Sustainable Future is another NGO that has played an important role for all the Major Groups after UNCED. It was set up in 1987, but reformed as a multi-stakeholder body in 1993 to reflect Agenda 21. Stakeholder Forum seeks to shape a strategic movement to influence and implement the outcomes of UN agreements on sustainable development and the Millennium Development Goals.[13]

The Climate Action Network (CAN) is the primary facilitator for NGOs at the climate COPs. CAN is a worldwide network of over 600 Non- Governmental Organizations (NGOs) from a little under 100 countries working to promote government and individual action to limit human-induced climate change to ecologically sustainable levels.[14]

Outsider versus insider tactics – different NGOs playing different roles

The power of NGOs in sustainable development governance can be on different levels. Many influence Governments in various ways, by making contacts with policy-makers, participating in the official processes, lobbying in corridors, and acting as watchdogs following up the promises that Governments have agreed upon. Others demonstrate to get media attention and to mobilize the public, who in turn influence governments through their voting powers. Outsider tactics by NGOs include classic protests, manifestations, rallies, actions, civil disobedience, etc.

In the UN context, most of the accredited NGOs act as a 'loyal opposition' to the UN and do not put its existence, principles and objectives into question. For many NGOs, the primary gain of being active in the UN is that they get the possibility to network with other NGOs with whom they can form partnerships.[15] For example, the NGO Forum organized in Rio parallel to UNCED had 18,000 participants, and the one in Johannesburg in 2002 had 35,000.

In other cases, NGOs can be useful for the UN itself by providing expertise and information that governments and secretariats are not aware of, by suggesting innovative proposals for solutions, or by increasing legitimacy and transparency through their presence. In some cases NGOs are acting as mediators between divergent positions and can broker agreements by lobbying governments.[16] Through all the different roles NGOs are playing, they often manage to act as moral stakeholders and help the UN advance its goals towards sustainable development.

Challenges and Conflicts

Lack of formalized rules for NGO participation

NGO participation in international sustainable development governance has to some extent been based on a degree of flexibility: much of the participation has been derived from informal practice. There is a substantive degree of difference in rules of procedure between the first and second decade of SD governance following UNCED in 1992. During the former, the lack of

[11] http://www.ipen.org/ipenweb/firstlevel/about.html
[12] http://www.ban.org/index.html
[13] http://www.stakeholderforum.org/
[14] http://climatenetwork.org/about/about-can
[15] Clark, A.Friedman, E.&Hochstetler, K.(1998).*The Sovereign Limits of Global Civil Society: A comparison of NGO participation in UN world conferences on the environment, human rights, and wome,* WorldPolitics, no 51(October), page 1-35.
[16] Smith,C.(2006).*Politics and Process at the United Nations,* Boulder: Lynne Rienner Publishers, page 115.

explicit rules was viewed by many as a risk, and afforded no consistency, as NGO participation would be subjected to an impromptu decision by a bureau where the outcome would be decided not by a set of rules but whether the majority of the bureau members had a positive or negative view of civil society. Precedence was created during the first decade of CSD, when it was possible to achieve far greater levels of access and participation on an informal basis than would be allowed officially. NGOs were afforded access to, and were able to speak in, 'informal' and 'informal informal' intergovernmental sessions. The informality of arrangements at the CSD allowed for greater advancements in practice, but also brought the risk that these advancements could be revoked at any time.[17] During the decade following Johannesburg in 2002, the best of these rules have been formalised and collected in so-called guidelines for the major group community. CSD 11 in 2003 had a mandate to deal with major group participation, and CSD as well as UNEP have today documented to a larger extent rules of procedure. And whereas the central UN hubs seem to have adopted standards for NGO participation, the regional offices and national offices of the intergovernmental system seem to have rules and regulations of their own, often limiting or excluding NGO participation.

Different accreditation rules across the UN system

Complicated processes for getting consultative status with different UN bodies is sometimes a barrier to participation. NGOs must submit a large number of supporting documents, such as annual reports, financial statements, statutes or charters, registration certificates or tax identification numbers, etc. when they apply for accreditation. In some countries, especially in parts of the world where civil society is not strong and NGOs are suppressed by governments, this information may be difficult to obtain. Once the documentation has been submitted, the process for screening the application may in some cases take years to complete. In the ECOSOC context, the application is first reviewed by the NGO Branch and then submitted to the Committee on NGOs, who recommend whether ECOSOC should accept or not accept the NGO.[18] The process is expensive, costing around $26,000 per accredited applicant, and it is not uncommon that an NGO gets accepted or rejected due to political rather than technical reasons.[19] The NGO Committee is a subsidiary body to the ECOSOC composed by member states with their own sets of values, and some parties may try to block the participation of NGOs that are critical of their positions.

Unbalanced participation

Until 2002, it was not uncommon for the majority of NGO representatives who spoke at UN meetings to be white, male, and from Northern countries.[20] Furthermore, the vast majority of NGOs in consultative status were from the North, although the number of NGOs from the South has been increasing every year since 1992.[21] This imbalance, which has been visible until the beginning of this century, indicated that NGO representation in the UN was skewed in favour of the Global North. Many asserted that the cultural domination in meetings often made it more difficult for delegates from Southern NGOs to get their perspectives through. This was however countered by conscious efforts by NGOs to allow southern delegates speak. Another problem was that some southern NGOs were centered in the capitals of their countries, and had little contact with their grassroots.

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[17] M. Howell (1999). *The NGO Steering Committee and Multi-stakeholder Participation at the UN Commission on Sustainable Development*. FIM Montreal, Canada.

[18] United Nations(2009).*Apply for consultative status*. Retrieved from http://esango.un.org/paperless/Web?page=static&content=apply

[19] United Nations (2004, June 11). *We the Peoples: Civil society, the United Nations and global governance.* A/58/817.

[20] United Nations (2004, June 11). *We the Peoples: Civil society, the United Nations and global governance.* A/58/817. Retreived from http://daccess_dds_ ny.un.org/doc/UNDOC/GEN/N04/376/41/PDF/N0437641.pdf?OpenElement

[21] Smith, C (2006). Politics and Process at the United Nations.Boulder: Lynne Rienner Publishers, page 115.

Among the significant barriers to Southern NGOs to participate has been cited as a substantial lack of funding, although Northern-based NGOs working on network issues at the UN often suffered from lack of funds to participate in intergovernmental processes too. This was often caused by political priorities among donor institutions and countries, as the donors more often than not prioritized participation in so-called development-oriented projects and not sustainable development governance. Over the past few years the economic crisis has hit the NGO world as well, exacerbating participation problems.

Digital divide when relying entirely on the Internet
While Internet has proven useful for improving access to information and increasing global communication, barriers caused by a digital divide occur when online services are not equally accessible to NGOs in all regions. As the Internet has become widely used in all countries, it is sometimes forgotten that many millions of people don't have access to information online at all, and that services are slower and less reliable in many parts of developing countries. As long as access to the Internet is not universal, information has to be made available through other channels as well.

Way Forward

Ensure better access to information
As a general rule, all NGOs and the public at large should have access to information that feeds into the decision-making process for sustainable development. Only in few cases there may be reason for confidentiality. International institutions should reach out actively and engage in education activities to inform relevant NGO communities about their activities. Since the Aarhus Convention has been successful in Europe, it could be scaled up to universal membership. Alternatively, it could serve as an example for other regions or the global level to adopt similar rules.

Further improving UN-NGO relations
The Cardoso report in 2004 produced many interesting ideas that may warrant a revisit. Despite that fact that the report and its related documents are nearly ten years old, the report contain proposals that still could be useful for bringing greater coherence and consistency to UN-NGO relations. Ideas that have been supported by members of the NGO community to progress in that direction include:

- Ensuring access of NGOs to all relevant UN and government meetings on issues related to sustainable development, according to the commitments made by the intergovernmental community in various outcome documents. In circumstances when limitations to the number of participants are required, it may be useful to create advisory NGO bodies as a means for coordination among NGOs and structuring their input in decision-making. Such bodies need to be set up with balanced membership.
- further formalizing the rules that govern NGO participation in relevant international institutions, in order to avoid decreased rights for NGOs to participate in the future. Establishing minimum standards for NGO participation would keep opportunities open for greater NGO participation where appropriate. Many have proposed that standards could be adopted as separate guidelines or be included in revised rules of procedure.[22]

[22]Oberthur et al (2002). *Participation of Non-Governmental Organizations in International Environmental Cooperation. Legal Basis and Practical Experience.* Ecologic Centre for International & European Environmental Research, Berlin.

- Reviewing accreditation rules for NGOs. As a general rule, all NGOs qualified in relevant matters should be entitled to accreditation in any international institution involved in sustainable development governance. Also, in some cases there are accreditation fees for NGOs, but that should be avoided since it restricts transparency through the disincentive it provides for NGO participation.[23]
- Make funding available to support the participation of less wealthy or underrepresented NGOs in UN processes. Southern NGOs are not always poorer than Northern based NGOs, so an assessment must be made to ensure that the NGOs in most need are given priority in receiving financial support for effective participation. Other reasons for unbalanced representation may be underlying causes such as attitudes and insufficient NGO structures, which can be addressed through targeted capacity-building.
- In order to ensure proper application of the rules governing NGO participation in international sustainable development governance, some have suggested establishing an implementation review mechanism. This could be for example a review panel or an independent ombudsman for NGOs. A first step towards more encompassing review mechanisms could be to establish a regular evaluation of the rules and procedure for NGO participation in relevant institutions.[24]

[23]Oberthur et al (2002). *Participation of Non-Governmental Organizations in International Environmental Cooperation. Legal Basis and Practical Experience*. Ecologic Centre for International & European Environmental Research, Berlin.
[24]Oberthur et al (2002). *Participation of Non-Governmental Organizations in International Environmental Cooperation. Legal Basis and Practical Experience*. Ecologic Centre for International & European Environmental Research, Berlin.

Chapter 28: Local Authorities' Initiatives in Support of Agenda 21

Introduction

Agenda 21 recognizes Local Authorities as a crucial actor for the achievement of sustainable development. Local Authorities are responsible for the design and execution of policy in cities, towns and municipalities, which means they stand for the level of governance that is closest to most people in their daily lives. Many problems with unsustainable global consequences have their roots on the local level, where people live, work, build their dreams and experience their troubles. Single municipalities can have significant impact on making global trends unsustainable or sustainable, since the cumulative effect of concerted multi-local action is profound on the global scale.

Local authorities recognized the potential importance of UNCED. Many were working proactively on the ground addressing issues in line with sustainable development, and felt an urge to get involved in the global preparations for the Earth Summit. In 1990, 200 local governments from 43 countries convened at the United Nations in New York and founded the International Council for Local Environmental Initiatives, which is today called ICLEI – Local Governments for Sustainability.[1] ICLEI took on the role to actively follow the intergovernmental preparations for UNCED, and to raise the profile of local authorities in sustainable development by linking local action to global policy. Immediately preceding the opening of UNCED in Rio 1992, the city of Curitiba in Brazil hosted an UNCED World Urban Forum initiated by ICLEI. The Forum resulted in a document called the Curitiba Commitment that calls upon local governments to commit to creating Local Agenda 21 processes and reporting on their progress by June 1993.[2] The same goal in a shorter version and different date was included in Chapter 28 of Agenda 21 and endorsed by the intergovernmental process.[3]

With only seven paragraphs, Chapter 28 is among the shortest Agenda 21 chapters. Nevertheless it is probably the one that has mobilized the largest number of people to participate in implementation of Agenda 21, by increasing awareness and action on all sustainable development issues at the household, workplace and community level in all parts of the world. Chapter 28 also includes objectives for information and experience exchange between local authorities, and for international organizations to provide support to local governments when needed.[4]

Since 1992, the preconditions for local governance have changed with increased globalization and unprecedented interaction between different local contexts. Global trends have made it not only beneficial but absolutely unavoidable for local authorities to relate to what is going on in the rest of the world. One of today's most crucial challenges is to turn the world's cities from being a global burden to becoming centers for the world's sustainability solutions, a transition in which local governments have a key leadership role to play. These and other global trends are putting growing demands on local authorities in the 21st century.

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[1] ICLEI (2010). *ICLEI Local Governments for Sustainability. Local Solutions to Global Challenges. Connecting Leaders – Accelerating Action – Pioneering Solutions.* Booklet from ICLEI Bonn Center.
[2] ICLEI (1992). *Initiatives #3.* The Organizational Newsletter of the International Council for Local Environmental Initiatives. Toronto, June 1992.
[3] Agenda 21, Chapter 28, paragraph 28.2a.
[4] http://www.un.org/esa/dsd/agenda21/res_agenda21_28.shtml

Implementation

Major Group implementation

From Rio to Johannesburg: A decade of Local Agenda 21

The first objective of Chapter 28 reads as follows: *"By 1996, most local authorities in each country should have undertaken a consultative process with their populations and achieved a consensus on 'a local Agenda 21' for the community"*. The early 1990's were characterized by experimentation with the Local Agenda 21 concept, with an increasing number of local authorities around the world embracing the idea and trying different approaches for implementation in their local communities. The earliest movers in general were developed countries, since many local authorities there already had some kind of local environmental initiatives that they changed names on and adapted to the new framework. Local authorities in developing countries often started from scratch with Local Agenda 21, resulting in more projects focusing on immediate development or service needs. By 1996, more than 1,800 local governments in 64 countries had undertaken Local Agenda 21 processes.[5] The number had grown by 2002, when 6,416 local authorities in 113 countries were found to be actively undertaking Local Agenda 21 processes or had made a formal commitment to LA21.[6] During the Local Government Session at the World Summit on Sustainable Development (WSSD) in Johannesburg 2002, the next phase of Local Agenda 21 was launched as an implementation framework called 'Local Action 21', with the aim to support local governments' ongoing efforts in response to Agenda 21, the Rio Conventions, the Habitat Agenda, and the Millennium Declaration.[7]

From Local Agenda 21 to mainstream local sustainability action

Local Agenda 21 has been one of the most extensive follow-up programmes to UNCED and is widely cited as an unprecedented success in linking global goals to local action. By witnessing or getting involved in LA21 initiatives in their communities, millions of people became more aware of sustainable development issues and saw the connections between their everyday actions and global change. In some countries all work places were required to implement their own Local Agenda 21 activities, and in local communities that took LA21 particularly serious, a whole new generation has grown up with sustainable development as an obvious common goal. While the name 'Local Agenda 21' has gone out of fashion and is less commonly used now than in 2002, many local authorities around the world are currently undertaking activities or have adopted strategies that could broadly be categorized as Local Agenda 21.

New focus: climate change strategies, adaptation and resilience

The last decade and especially the last five years have seen a growing focus on climate change in governance for sustainability on all spatial levels. This trend is clearly visible in local political contexts, where many local authorities are predominantly dealing with climate issues in their work for sustainable development. One driver for this is the international community's increased interest in the climate agenda, which has made more funding available for local activities on climate change. Some local authorities have simply changed the name of their Local Agenda 21 programme to instead call it 'Local Climate Strategy'.

[5] ICLEI & UNDPCSD (1997, March). *Local Agenda 21 Survey. A study of responses by local authorities and their national and international associations to Agenda 21*.

[6] UN DESA (2002). *Second Local Agenda 21 Survey. Background paper no. 15*. CSD acting as the preparatory committee for WSSD, second preparatory session 28 January-8 February 2002. Submitted by ICLEI. DESA/DSD/PC2/BP15.

[7] ICLEI (2002). *Local Action 21 – moving from agenda to action.* Initiatives, special feature.

Stakeholder participation in local governance for sustainability

Multi-stakeholder participation in all steps of governance is broadly recognized as a prerequisite for sustainable development. Public participation is included in the very definition of Local Agenda 21, since Chapter 28 requires local authorities to enter into dialogue with its citizens, local organizations and private enterprises. A sub-objective in Chapter 28 specifically mentions that women and youth should be included in decision-making, planning and implementation processes by local authorities to ensure livable communities. A risk when local governments turn away from Local Agenda 21 to climate and sustainability strategies in general is that participation is not automatically kept as a requirement. Participation is understood differently in different places and may also be a cultural issue. Citizens may be invited to approve ideas formulated by local authorities, to present their own ideas, or to participate in deliberations for co-production of knowledge and consensus building. Many local governments realize the benefits of citizen dialogues and have kept developing the concept and methods further. Some local authorities in Latin America have discovered that public participation is effective for generating more resources for them, since it makes citizens feel ownership and makes them more willing to pay taxes.Switzerland is a deeply decentralized country where features of direct democracy grant ordinary citizens a detailed level of participation, in which small villages have reunions of all citizens instead of local parliaments.[8] Growing access to internet and social media has made it possible for local authorities to involve more people, decrease costs of participation processes, and reach out to new social groups.Global information systems (GIS) have also made new and innovative participation projects possible. The Map Kibera Project in Nairobi, Kenya is an example of how inhabitants in Africa's second largest informal settlement are involved in using data and infographics to create the first existing map of their community for addressing environmental issues.[9]

Public procurement for sustainable consumption and production

Unsustainable consumption and production practices are driving many sustainability problems. Local authorities can work to address this by using sustainable public procurement (SPP) as a tool. SPP means responsible spending of public money on products and services that do not harm the environment or workers, but that foster sustainable development. Local governments are uniquely positioned to contribute to a green economy by making active procurement choices that integrate social and environmental criteria in purchasing policies.[10] SPP has grown much faster on the local than on the national level, and is most common in OECD countries but also getting more established in countries such as Brazil, China, Korea, Malaysia, Mexico and South Africa. SPP often involves innovative partnerships between local authorities and the business sector, including agreements on pre-commercial procurement that contributes to the development of products with higher environmental and social criteria than what is currently found on the market.[11]

Local authorities becoming development cooperation actors

Chapter 28 promotes increased collaboration between local authorities, and one way in which local governments are meeting that objective is by supporting each other through development assistance and funding. In recent years there has been a decentralization trend in development cooperation, with a growing number of local authorities providing financial support to counterparts in lower income countries around the world. Such municipal international cooperation for sustainability changes the playing field of development donors. When local and regional governments finance activities abroad, it is more common that the funding reaches the

[8] http://www.democracy-building.info/switzerlands-political-system.html
[9] http://mapkibera.org/
[10] http://www.iclei.org/index.php?id=796
[11] Perera, O., Chowdhury, N., Goswami, A. (2007). *State of play in sustainable public procurement*. IISD/TERI.

local level as direct recipients and the money may often be used more effectively. Local governments do not usually call themselves donors but rather partners for development, and the receiving partner commonly takes full ownership of the project in line with their local development strategy. An interesting example and pioneer in this context is Barcelona. Since 1994 there has been a decision to use 0.7% of Barcelona's municipal budget for development cooperation.[12]

Local authorities working together through associations

Another way for local authorities to collaborate with each other is through local government organizations (LGOs). Recognizing the benefits of supporting each other rather than working in isolation with issues they have in common, many local authorities have joined together in national or international LGOs. Three local government associations are mentioned in Agenda 21 Paragraph 28.4. They are the International Union of Local Authorities (IULA), the United Towns Organization (UTO), and the World Association of the Major Metropolises (Metropolis). IULA was the first global association for local governments founded in 1913, UTO was created in 1957, and Metropolis in 1985. In 2004 they merged together and created a new world organization called the United Cities and Local Governments (UCLG).[13]UCLG has members in more than 100 countries in all world regions and is headquartered in Barcelona, Spain. It brings together the individual cities that were members of UTO and the national associations of local governments that formed the majority of IULA's membership.[14] Metropolis is the Metropolitan Section of UCLG and is also an association of its own with representation across the world.[15] According to its website, UCLG is the largest association of local governments in the world, and understands itself as the united voice and world advocate of democratic local self-government. While not created with the purpose of working for sustainable development, UCLG has followed the trend of mainstreamed interest in sustainability among its members, and is now involved in preparations for the UN Conference on Sustainable Development (UNCSD) among other sustainability work.[16] ICLEI – Local Governments for Sustainability has kept the role as Organizing Partner for the Major Group on Local Authorities in in CSD and in UNEP. In the UNEP Major Groups Facilitating Committee, a representative from the Network of Regional Governments for Sustainable Development (nrg4SD) has joined ICLEI in the role. The nrg4SD was established at the Johannesburg Summit in 2002 and includes around 50 subnational governments from 30 countries and seven associations of subnational governments.[17]

ICLEI is the international association of local authorities that has played the most critical role in conceptualizing, advocating, monitoring and supporting local authorities in their work for local sustainability. Much of the information on global overviews and trends in Local Agenda 21 implementation is available thanks to studies undertaken by ICLEI and partners. A first Local Agenda 21 Survey report was published timely for Rio+5 in 1997[18], and the results of the Second Local Agenda 21 Survey were made available in the preparatory process for the Johannesburg Summit (WSSD) in 2002.[19] Both studies collected quantitative data from local authority associations and institutions, as well as qualitative data directly from local governments.[20] ICLEI

[12] Smith, J. (2011). *Decentralized development cooperation – European perspectives.* PLATFORMA http://www.ccre.org/docs/Platforma_European_perspectives_EN.pdf
[13] http://www.citymayors.com/features/iula.html
[14] http://www.citymayors.com/orgs/unitedcities.html
[15] http://www.metropolis.org/joining-metropolis
[16] http://www.cities-localgovernments.org/
[17] http://www.nrg4sd.org/about-nrg4sd
[18] ICLEI & UNDPCSD (1997, March). *Local Agenda 21 Survey. A study of responses by local authorities and their national and international associations to Agenda 21*.
[19] UN DESA (2002). *Second Local Agenda 21 Survey. Background paper no. 15*. CSD acting as the preparatory committee for WSSD, second preparatory session 28 January-8 February 2002. Submitted by ICLEI. DESA/DSD/PC2/BP15.
[20] Walker, Judy (ed.) (2002). *Local governments' response to Agenda 21: summary report of Local Agenda 21 survey with regional*

has prepared other publications as well, including a briefing sheet on Green Urban Economy in preparation for Rio+20.[21] Based on this work, ICLEI plays an active role in global advocacy in arenas such as the UNFCCC, UN CBD, UN CSD, UNEP, and UN-Habitat.

National and regional implementation

National governments encouraging local authority action for sustainability

While there are no activities in Chapter 28 specifically requested from national governments, the levels of governance are interconnected and mutually supportive in Agenda 21 implementation. In the first years after UNCED, some national governments launched national campaigns for Local Agenda 21 and provided technical and financial support to local authorities that got involved. In some cases national governments made it a legal obligation for local authorities to implement Local Agenda 21, and later the same requirement has been put in place for work on climate change or other sustainable development issues. In many European countries, it was mandatory to participate in the Local Agenda 21 campaign that has now been switched for climate strategies. It is argued whether decentralization laws came first, or whether it was the other way around that proactive local sustainability initiatives came first and made decentralization possible. In many cases it is not obligatory for local authorities to adopt a strategy for sustainable development, but that the plans are put in place does not guarantee that they are guiding everyday activities on the local level. National governments are using different methods to support an increasing level of implementation of local sustainable development strategies. In Canada the tax incomes for gas are set aside for sustainability projects, and local authorities can apply for funding by presenting a plan. In India, the introduction of a public participation process is a prerequisite for local authorities to access national funds for sustainability projects. Involvement of national donors in local sustainability initiatives has also become more common across borders. For example, the German and Canadian governments support municipal partnerships on climate in developing countries. In some cases national governments are inviting mayors and representatives of local authorities to be part of official national delegations to intergovernmental meetings.

International implementation

UN-Habitat working closely with local authorities

Agenda 21 Paragraph 28.4a calls for UN-Habitat to strengthen information gathering on local authorities' strategies and their needs for support. Collaboration between UN-Habitat and local authorities takes place at all levels, and UN-Habitat recognizes local authorities as key partners because of their role as managers of the world's cities.[22]Already before UNCED in 1990, UN-Habitat (then called the United Nations Centre for Human Settlements, UNCHS) established a Sustainable Cities Programme (SCP), a joint initiative with the United Nations Environment Programme (UNEP) that became the first major international support programme for planning in line with Local Agenda 21. UN-Habitat also launched a Localising Agenda 21 Programme during the preparatory process for the United Nations Istanbul Conference on Human Settlements (Habitat II).[23]

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focus.ICLEI.

[21]ICLEI (2011). *Briefing sheet: Green Urban Economy*.
http://www.iclei.org/fileadmin/user_upload/documents/Global/News_Items/Image_Documents_web_news_11/Briefing_Sheet_Green_Urban_Economy_20110215.pdf

[22]http://www.unhabitat.org/categories.asp?catid=365

[23] ICLEI & UNDPCSD (1997, March). *Local Agenda 21 Survey. A study of responses by local authorities and their national and international associations to Agenda 21*.

Habitat II was organized in 1996 and gave international recognition to the importance of decentralization and strengthening of local authorities in its Istanbul Declaration.[24] Since then it has been widely recognized that local authorities are the closest partners of national governments in the implementation of the Habitat Agenda. In 1999, the Governing Council of the Commission on Human Settlements asked the Executive Director of UN-Habitat to establish an advisory body of local authorities to strengthen the dialogue with local authorities involved in the implementation of the Habitat Agenda. This became the United Nations Advisory Committee of Local Authorities (UNACLA), which held its inaugural meeting in Venice, Italy in January 2000. A wide spectrum of leaders from local governments and global and regional associations of local authorities attended and adopted the Venice Declaration. UNACLA has continued to meet and work closely with UN-Habitat.[25]

In 2002, the first ever World Urban Forum (WUF) was held at the headquarters of UN-Habitat in Nairobi, Kenya.[26] The World Urban Forum was established to examine the impact of rapid urbanization on cities, communities, policies, economies, and climate change. The WUF is organized biannually and has grown into the world's premier conference on cities that brings together a diverse mix of local and national authorities, UN professionals, academics, slum dwellers and other stakeholders. It took place in Barcelona in 2004, Vancouver 2006, Nanjing 2008, and Rio de Janeiro in 2010. The 6th WUF will be held in Naples, Italy from 1-7 September 2012.[27]

UNDP programmes in support of local authorities

The United Nations Development Programme (UNDP) is mentioned in Paragraph 28.4 as another international organization that should support local authority programmes for sustainable development. Today this is happening primarily in response to the Millennium Development Goals. Back in 1992, UNDP launched the programme 'Capacity 21' with the purpose to help developing countries with capacity-building for integration of Agenda 21 principles into national planning and policy-making, while involving all stakeholders in the process. While the original mandate was to work on the national level, many national governments asked for assistance in using a more decentralized approach. Capacity 21 therefore aimed at linking strategies for national and local level Agenda 21 implementation.[28] Another UNDP programme established as a follow-up to UNCED in 1992 was the Local Initiatives for the Urban Environment (LIFE) Programme. By providing funding for Local Agenda 21 implementation through small-grant assistance given directly to local collaborative projects on sustainable development, the LIFE Programme acted as an incubator for LA21 in some parts of the world.[29]

The World Bank and international donors funding local sustainability

Paragraph 28.4 mentions the World Bank and regional banks as important for supporting local authority programmes. The World Bank is one of the founding members of the Cities Alliance, along with UN-Habitat, 10 donor governments, UCLG and Metropolis. It is a global partnership for promoting the role of cities in sustainable development and reducing urban poverty. The Cities Alliance was set up in 1999 and has a Catalytic Fund for in-country programmes for cities and local authorities.[30] When it comes to funding for local governance, it can be said that local sustainability and climate is currently one of the most popular areas for international donors to

[24] http://ww2.unhabitat.org/declarations/Istanbul_declaration.pdf
[25] http://www.unhabitat.org/content.asp?typeid=19&catid=366&cid=128
[26] http://www.unhabitat.org/content.asp?typeid=5&catid=7&cid=2609
[27] http://www.unhabitat.org/categories.asp?catid=672
[28] UNDP (2002). *Capacity 21 Global Evaluation Report 1993-2001.* http://www.beta.undp.org/undp/en/home/librarypage/capacity-building/cap21_global_evaluation_1993-2002.html
[29] ICLEI & UNDPCSD (1997, March). *Local Agenda 21 Survey. A study of responses by local authorities and their national and international associations to Agenda 21.*
[30] http://www.citiesalliance.org/ca/how

invest in. Analyses of the Millennium Development Goals show that international donors work primarily with the country level, mainly because administrative systems are set up like that. In many cases, funding might be more effectively used if donors work directly with local authorities, but national governments might not want to be bypassed by international donors working with their cities.

Challenges and Conflicts

Challenging need to double urban infrastructure until 2050
Statistics show that the human population in cities, which is currently 3.5 billion, will likely amount to around 6 billion people in 2050. This in itself is a major challenge, and it must be done in ways that generate sustainable urban futures through localized solutions. The rapid urbanization ahead provides major business opportunities, and the private sector is an obvious partner for local authorities to implement sustainability plans. It will be crucial to form public-private partnerships in ways that take citizens and civil society views seriously and do not build ourselves into trouble, since decisions taken now will impact many decades.

False decentralization without legal and financial support
For local authorities to be successful in their work for sustainable development, it is crucial that favorable conditions are put in place by national governments, since there is a limit to what local authorities can achieve on their own. Supportive conditions like legal, financial and political support for local sustainability is often missing on the national level. When decentralization laws are put in place and local authorities are expected to take full responsibility for implementation without proper support from the national level, it cannot be called true decentralized multi-level governance, but is simply a manifestation of national governments trying to run away from their responsibility. A similar situation may occur if foreign donors set up expensive and poorly anchored development project that collapse in local communities when the donor leaves.

Cities as green technology showcases without stakeholder participation
While multi-stakeholder participation was a requirement in Local Agenda 21 planning, a current trend in city building is master-planned projects carried out by governments and building companies alone, often in the form of green technology showcases in Asia. Green economy tends to perceive sustainable cities only in terms of technology, while cutting off the population and the social dimension of sustainable development. Experiences warn that privatization of municipal services may get unintended negative results. Building cities that nobody wants to live in is a major mistake, and stakeholders should be involved for making sure that plans for true eco-cities meet the desires of local citizens. Just any participation process is not enough either, since is a problem that participation processes can easily be manipulated to exclude certain groups. For example, people with disabilities are seldom included although it is crucial for their lives that built environments and infrastructure meet their needs.

Lack of coordinated global monitoring for comparable local data
While there are a lot of case studies available on local sustainability, including a number of analyzes that compare a few, it is hard to find any that go above the regional level. When it comes to assessing global trends based on quantitative data, it is almost an impossible task since nobody has kept track of local sustainability processes with a comprehensive global monitoring role. Statistics exist from single countries but the data is often not comparable.

Focus on cities while forgetting local authorities in rural communities
In 1987, the World Commission on Environment and Development stated in 'Our Common Future' (the Brundtland report) that "*The future will be predominantly urban, and the most immediate environmental concerns of most people will be urban ones*".[31] While rapid urbanization has continued as a global trend since, there are local authorities in many parts of the world that are facing the opposite challenge. Thinly populated areas struggle to sustain when its elderly population needs increasing support but its youth move away to seek job opportunities in the cities. Perhaps it is a mistake to focus on the future as being only urban, while policy measures could be taken for more viable rural communities.

Misleading UN definition of local authorities as 'non-governmental'
The UN Charter recognizes Governments, International Organizations, and Non-Governmental Organizations as the three categories of legitimate actors in the UN.[32] In light of this, all the nine Major Groups in Agenda 21 have by default been defined as belonging to the NGO sector in UN contexts. This is however problematic in the case of local authorities. While national and international associations of local authorities are 'non-governmental' as such, the local governments they represent are elected to serve local communities with the same legitimacy as national governments. Grouping together local authorities with NGOs is misleading and incorrect, causes mayors participating in UN meetings to feel uncomfortable, and is ignorant of the legitimate role of large megacities as global actors.[33]In December 2010 in Cancún, a UNFCCC decision for the first time recognized local authorities as a governmental actor in intergovernmental climate negotiations. This recognition is needed in other parts of the UN as well.

Way Forward

Vertical integration: Multi-level governance
An institutional framework for sustainable development based on multi-level governance is the way forward. All governance levels from local through global need to be vertically interconnected for bottom-up energy to meet top-down support. In order to bridge the gaps between different levels of governance well as between agenda and action, local governments need to be given a more prominent role in global UN processes. The intergovernmental level should recognize that local authorities have similar legitimacy compared to national governments, and with many local authorities governing bigger populations than the 150 smallest UN member states, it would be reasonable if they could get voting rights in the UN. New institutional arrangements for sustainability should be based on a multi-level concept of governance and include elected representatives from local, sub-national, national, regional and ultimately global levels. In the other direction, it is imperative that decentralization policies are accompanied with all the needed political, legal and financial support that local authorities need for implementing their localized strategies for sustainability.

Horizontal integration: Multi-stakeholder participation in local governance
Political leaders, planners and builders of cities and communities must collaborate for sustainable local development. Multiple stakeholders must be involved in local governance for resilient communities and sustainable futures, including civil society organizations, women, youth, people with disabilities, minorities, trade unions, industry, and any other actor that is relevant in the local

[31] WCED (1987). *Our Common Future*. World Commission on Environment and Development. Page 225.
[32] UN Charter
[33] Otto-Zimmermann, Konrad (2011). *NGO – the questionable charm of being defined by what you aren't. A call for renaming an important group of actors.* ICLEI Paper 2011-2.

context. True and meaningful citizen participation must build upon four principles: Representation of all relevant actors; Collaboration through democratic meeting methods; Integration of multiple perspectives; and Usability of results. Another ally for local authorities with a very important role is the academic research community, in particular local universities and research institutes. Academics can act as knowledge brokers in multi-stakeholder processes, by bringing together citizens and practitioners from multiple sectors and backgrounds in transdisciplinary processes and aligning competing interests behind a common approach. In such forms of science, quality of research is determined by the applicability and usability of results. While there is still much to learn about methods for co-producing knowledge and building inclusive consensus, transdisciplinary research projects are already being implemented in some communities with positive results. Since there is an urgent need to find better ways of engaging stakeholders and bridging the gaps between knowledge, policy-making and implementation also on the intergovernmental level, participatory research experiences can be brought upwards on the vertical line and be designed to improve also global governance.

Chapter 29: Strengthening the Role of Workers & Their Trade Unions

Introduction/Context

Decent employment and job creation are central to the social dimension of sustainable development and especially to poverty eradication. Greater equity in income distribution and human resource development are major challenges everywhere. Trade unions have a long history of addressing industrial change, promoting socially responsible economic development, and millions of workers will be needed for putting green solutions into practice. Workers and their Trade Unions are therefore crucial actors for sustainable development.

In preparation for UNCED, the International Confederation of Free Trade Unions (ICFTU) held its 15th World Congress in March 1992 on the theme 'Democracy and the environment', and for the first time invited ecological groups such as Greenpeace and the WWF to participate. The 1000 participants pleaded for the preservation of the environment and reaffirmed their commitment to democracy with respect of human rights. ICFTU formulated a series of proposals for UNCED, encouraging governments to take practical action and involve Trade Unions as a hand to carry it out.[1] In preparation for the 2002 Johannesburg World Summit on Sustainable Development (WSSD), the Secretariat invited ICFTU to be the organizing partner for the dialogue segment on workers and trade unions. Through its Trade Union Advisory Council (TUAC) to the OECD, ICFTU coordinated the preparation of a dialogue paper in consultation with trade unions worldwide.[2] Trade unions also published their own preparation document entitled 'Fashioning a New Deal'.[3] WSSD included a full range of issues on the agenda that workers everywhere considered important, including employment, livelihood, income, gender and poverty issues.[4]

In 2006, ICFTU and the World Confederation of Labour (WCL) dissolved themselves to pave the way for the creation of a single main international trade union organization that could represent the interests of working people worldwide. The new organization was founded in November 2006 and is called the International Trade Union Confederation (ITUC). In addition to former ICFTU and WCL members, ITUC attracted trade union organizations that had no global affiliation previously.[5]Based in Brussels, Belgium, ITUC represents 175 million workers in 151 countries and territories and has 305 national affiliates.[6] Since then, ITUC has been the Organizing Partner of the Major Group for Workers and Trade Unions in the CSD and in the UNEP Major Groups Facilitating Committee. In later years they have been joined by Sustainlabour, a trade union foundation established in 2004[7] to help implement trade unions' plans for sustainable development, with the belief that workers have a fundamental role to play on the route to a sustainable world.[8]

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[1] ICFTU (1999). *Trade Union World. Special 50th Anniversary Edition. How the ICFTU has influenced global developments year after year*. No 7, September 1999. Available online: http://www.icftu.org/displaydocument.asp?DocType=PressRelease&Index=990916344&Language=EN

[2] UN ECOSOC (2001). *Dialogue paper by workers and trade unions*. Multi-stakeholderdialogue segment of the second session of the CSD acting as the preparatory committee for the WSSD. E/CN.17/2002/PC.2/6/Add.6

[3] Global Unions (2002). *Fashioning a new deal: Workers and trade unions at the WSSD.Assessing our performance, the workplace perspective.*

[4] http://www.gurn.info/en/topics/sustainable_development/sustainable-development/issues/labour-environment-collective-commitments-for-sustainable-development-nov-06

[5] http://www.ituc-csi.org/about-us.html

[6] ITUC (2011). *Workers and trade unions' consolidated contribution to the United Nations Conference on Sustainable Development.* p. 3.

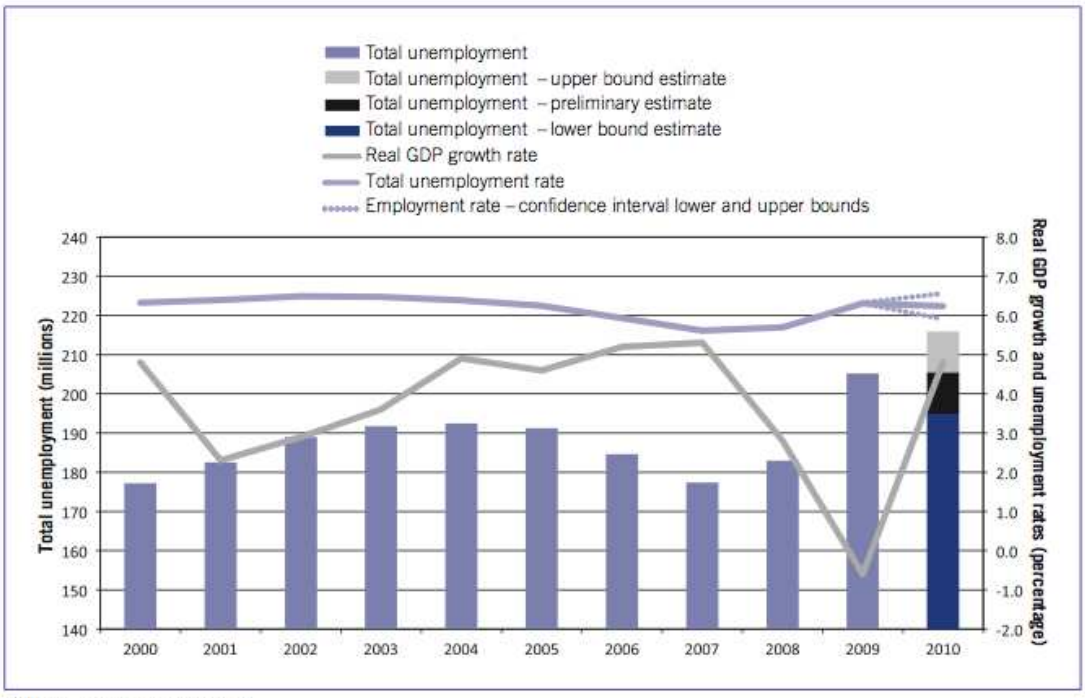
[7] http://earthmind.net/labour/background/sustainlabour.htm

[8] http://www.sustainlabour.org/iniciativa.php?lang=EN

Chapter 29 of Agenda 21 on strengthening the role of workers and their trade unions declares poverty alleviation and full and sustainable employment as its overall objective, which contribute to safe, clean and healthy environments. The three activity areas in Chapter 29 – (A) Promoting freedom of association, (B) Strengthening participation and consultation, and (C) Providing adequate training – aim at enabling the involvement of workers as full partners in the implementation and evaluation of activities related to Agenda 21.

Agenda 21 opened the way for a major expansion of trade unions' involvement in activities related to sustainable development. The social dimension of sustainable development has always been at the core of trade unions' principles, and high priority has been given to protection of the working environment. In addition, the last decadehaswitnessed far more connections with the related external environment in trade union's visions and activities. This has led to integration of the social and environmental dimensions of sustainable development in the policy design, campaigning and advocacy efforts of many trade unions.

Sustainable development requires that social justice and environmental protection get pursued simultaneously. For this to become possible, there is a need to govern the economic dimension and make it into a tool for all. Despitesome efforts and noted progress concerning the situation for workers, their families and their environments,there are also many cases of worsened conditions since UNCED. The Major Group for Workers and Trade Unions points out that inequalities have risen, natural resources are being depleted, and the economic system has run ungoverned for the benefit of a few. In the last ten years, there have been trends towards further exploitation of workers and the environment by irresponsible companies, the disengagement of governments from public policy and investment, markets' deregulation and speculation. These and other trends have generated simultaneous and unprecedented crises in many workers' lives, and further action in line with Agenda 21 Chapter 29 is urgently needed.



* 2010 are preliminary estimates.

Figure 1. Global unemployment trends, 2000-2010*.
Source: ILO (2011). *Global Employment Trends 2011. The challenge of a jobs recovery.* p. 12.

Implementation

National and regional implementation

Work-related accidents, injuries and diseases

One of the sub-objectives of Chapter 29 is to reduce occupational accidents, injuries and diseases among workers, and to use recognized statistical reporting procedures for showing progress. While the promotion of occupational safety and health (OSH) has increased in most countries since UNCED, work-related accidents are still unacceptably common, and governments in all parts of the world need to take stronger measures to prevent this. According to the International Labour Organization (ILO), approximately 2.3 million workers die from occupational accidents and diseases every year. In developing countries the recorded disease and accident rate has been increasing, and in addition there is likely to be unrecorded work-related injuries and death since a majority of workers are part of the informal economy. The risk to suffer accidents at work varies between different sectors. In both developed and developing countries, miners are unproportionately likely to get diagnosed with lung diseases due to exposure to coal, asbestos, silica and other harmful substances. Asbestos alone causes around 100,000 deaths annually and the figure is rising. In industrial countries, it has been calculated that construction workers are 3-4 times more likely to die from work-related accidents than other workers. In addition to the tragic social losses, the economic cost of illness and accidents has been estimated to 4% of the world's GDP.[9]

Emerging occupational health problems getting more common

Since 1992, many workplaces have been affected by major changes related to the emergence of more flexible forms of work organization, intensification of work, and introduction of new technology. The digital revolution has made computer based work much more common in the past decades, with computer related health hazards increasing as a result. One such disease is repetitive strain injury (RSI), which is an injury of the muscoskeletal and nervous systems that may be caused by work habits with bad ergonomics, mechanical compression, awkward positions and repetitive tasks. Types of RSIs that may affect computer users include work related upper limb disorder and non-specific arm pain.[10] A study from 2008 showed that 68% of UK workers suffered from some sort of RSI.[11] Other occupational health problems that have become more common in response to changes in the workforce structure is work-related stress and depressive disorders. This trend started before UNCED but has become more urgently widespread in the last decades, especially in industrial countries. Stress and psychological effects get common when employees are faced with less job security and greater demands. New safety standards are starting to be developed in response to various emerging occupational health problems, but more measures will be needed in the coming years, including major changes in the employment structure.[12]

National measures for occupational safety and health

Proactive national legislation and precautionary principles for preventing workplace related accidents are more common in developed than in developing countries. National legislation has a crucial role to play, since it is clearly visible that conditions for workers vary in different countries, and that companies seldom go beyond complying with minimum requirements in the respective countries they are active in. Many injuries and accidents can be prevented by keeping

[9] ILO (2009). *World Day for Safety and Health at Work 2009. Facts on safety and health at work.*http://www.ilo.org/global/resources/WCMS_105146/lang--en/index.htm
[10] http://news.bbc.co.uk/2/hi/technology/7761262.stm
[11] http://www.dailymail.co.uk/health/article-1024097/Two-thirds-office-staff-suffer-Repetitive-Strain-Injury.html
[12] Tennant (2001). *Work-related stress and depressive disorders.* Journal of Psychosomatic Research, no 51, pp 697-704.

premises and equipment at the workplace properly maintained, to ensure that machines, electrical devices and other tools get repaired if they break before someone gets hurt, and the maintenance must be done by someone with the required competence. Exactly what is needed varies between different sectors of work, but in cases when workers get in touch with harmful substances and chemicals, there must be limits and measures taken to reduce the exposure. Another example is the provision of protective equipment such as helmets, goggles, earplugs, etc. for workers in environments where that is needed, which has become obvious in many countries but is almost always missing elsewhere. It is crucial that governments keep strengthening national legislations for improving workers' rights, and carry out controls and inspections at the workplace to ensure compliance. Trade unions are also pushing business and industry to adopt their own proactive internal safety agreements, which some have done regardless of national legislation.

Collaborative mechanisms for health, safety and sustainable development

One of the objectives in Chapter 29, further elaborated in paragraph 29.7, is to establish mechanisms at both the workplace, community and national levels to deal with safety, health and sustainable development in combination. Employers and workers should run the mechanisms jointly, or they could be coordinated in a tripartite manner with employers, workers and governments. Paragraph 29.14 emphasizes the importance to facilitate greater collaboration by the tripartite social partners towards sustainable development by strengthening the capacity of each of them. Particular attention should be given to the role of women workers in sustainable development. Trade unions are convinced of the crucial need to realise the rights of women in order to succeed in sustainable development. As a consequence, multiple policies have been developed at all levels to increase the profile of women workers' rights.

Training on environment and workers rights and safety

One of the sub-objectives of Chapter 29 is to increase the availability of education, training and retraining for workers. Paragraph 29.12 elaborates that workers and their representatives should have access to training that aims to increase their environmental awareness, ensure their safety and health, and improve their social and economic welfare. They should be able to gain the necessary skills for improving the working environment and promoting sustainable livelihoods. In order to ensure that workers themselves feel that their needs for capacity-building are met, governments and employers should involve workers and trade unions in the design and implementation of these worker training programmes. A big amount of national actions exist today for building workers' capacity on environment, many of them carried out by governments and trade unions together, for example when it comes to HIV/Aids prevention and support to HIV positive workers.[13] Non-discrimination training and training for workers with disabilities are other examples.[14] For workers in the forestry sector, the Central Organization of Trade Unions (COTU) in Kenya along with the Building and Woodworkers' International have created training programmes to improve workers' health and to develop their skills and capacity. Several African trade unions started a successful project in 1998 entitled 'Global Project on Pesticides', which organized training sessions and developed training materials on chemicals, and is now being replicated in other countries.

Workers' environmental rights and collective agreements

An objective of Chapter 29 is to increase the number of environmental collective agreements aimed at achieving sustainable development. Collective agreements are commonly negotiated as a written contract between the employer and employees in each workplace. The most common

[13] UNAIDS (2006). *Global reach: how trade unions are responding to AIDS. Case studies of union action.*
[14] ILO (2002). *Managing disability at the workplace: ILO Code of Practice.*
http://www.ilo.org/public/english/support/lib/resource/subject/disability.htm

issues covered by collective agreements are still related to wages, leave and working hours, but it has become more common to include paragraphs on sustainable development and environmental issues. Paragraph 29.11a states that workers should be able to participate in environmental impact assessments and environmental audits at their workplace. Workers' environmental rights are also covered by legislation in some countries. In Canada for example, workers' rights to report workplace pollution is covered by law, which means that workers are secured from being fired if they report environmental damage that is caused by the workplace. Another law is the right of workers to refuse to pollute, which allows an employee to stop working when environmental damage is caused by the work. This is still developing and varies between different provinces and federal workplace jurisdictions.[15]

Workers' involvement in design, implementation and evaluation of policies

Paragraph 29.5 requests governments, business and industry to actively involve workers and their trade unions in designing, implementing and evaluating policies and programmes on environment and development. This could include industrial strategies, labour adjustment programmes, employment policies, and technology transfers. Paragraph 29.8 further calls on governments and employers to provide all the relevant information for making this participation effective. Although it happens sometimes in selected enterprises, and while it is recognized in some voluntary regional accords and sectoral collective agreements, worker's right to participate in decision-making in their workplaces on environmental concerns is not envisaged in national legislation.[16]

International implementation

ILO Conventions

On the intergovernmental level, the central actor for implementation and monitoring of issues in Chapter 29 is the International Labour Organization (ILO). ILO is a specialized agency of the United Nations created already in 1919, with 183 member states and 484 voting members in 2011. ILO is governed through a unique tripartite structure in which governments, employers and worker representatives have equal voices and together set labour standards, develop policies and design programmes.17 Agenda 21 paragraph 29.3a promotes ratification of relevant ILO conventions. In June 2011, ILO adopted its 189th convention, the Convention on Domestic Workers.18 A full list and information about all the ILO conventions is available in ILO's database of international labour standards, ILOLEX.19 A majority of the ILO conventions adopted before UNCED have gained additional ratifications since then. 16 new conventions have been adopted since UNCED, and all except three have entered into force. The number of ratifications of the post-UNCED ILO conventions that have entered into force range from 7 to 25, except from the Worst Forms of Child Labour Convention (convention number 182) from 1999, which 174 states have ratified.20The low rate of ratification and implementation of other relevant ILO standardshinder progress on sustainability, such the conventions on Safety and Health (C155), Chemicals (C170), Asbestos (C162), and many more.

Paragraph 29.4 especially mentions that governments should ratify the ILO conventions on individual workers' freedom of association and right to organize. Those ILO conventions also protect the regulation of working conditions through collective bargaining. Eight ILO

[15] http://www.workrights.ca/content.php?sec=8
[16] ITUC (2011). *Workers and trade unions' consolidated contribution to the United Nations Conference on Sustainable Development.*
[17] http://www.ilo.org/global/about-the-ilo/how-the-ilo-works/lang--en/index.htm
[18] http://www.ilo.org/ilolex/cgi-lex/convde.pl?C189
[19] http://www.ilo.org/ilolex/english/convdisp1.htm
[20] http://www.ilo.org/ilolex/english/newratframeE.htm

conventions were adopted on freedom of association, collective bargaining and industrial relations between 1921 and 1981.[21] The main one is the ILO Convention on Freedom of Association and Protection of the Right to Organise (C87), which has 150 ratification including 48 that have been added since UNCED.[22]

Strengthening trade unions in international environmental processes

In 2006, the UN Environment Programme (UNEP) in cooperation with ILO, Sustainlabour and the UN Global Compact organized the first ever trade union assembly on labour and the environment in Nairobi, Kenya.[23] Entitled the Workers Initiative for a Lasting Legacy (WILL 2006), the assembly involved representatives from over 150 trade unions, who underlined that environmental protection and job security are mutually supportive.[24] Based on the topics identified during WILL 2006, UNEP and Sustainlabour launched a two-year project on "Strengthening trade union participation in environmental processes" with special focus on the climate change and chemicals regimes in addition to the UNEP Governing Council/Global Ministerial Environment Forum.[25] The project was carried out in partnership with ITUC and its affiliates, ILO and the World Health Organization (WHO), with financial support from the government of Spain. The project focused on awareness rising among workers on the link between labour rights and environmental sustainability, adaptation and replication at the workplace level of positive trade union initiatives for the environment, and capacity-building for workers and trade unions on how to participate in international environmental negotiations. Training and capacity-building materials were published and synergies were built with other projects such as the SAICM project of Sustainlabour, the UNEP Green Economy Initiative, and the ILO Green jobs initiative.[26]

Major group implementation

Trade unions joining together on the global level

Hundreds of national trade union centres and sectoral federations have been involved in discussions on sustainable development at the regional and international level. In many cases they have agreed on policies that commit the labour movement to more sustainability action in the years to come. In addition to ITUC, there are several global associations of trade unions. Global Unions is one, in which TUAC is a member along with others who want to work together with a shared commitment to principles and ideals of the trade union movement.[27] The work of Global Union Federations (GUFs) is increasingly recognized by multilateral companies, and in some cases this has led to interactions and International Framework Agreements.[28]Other examples are the International Federation of Chemical, Energy, Mine and General Worker's Unions (ICEM), the International Transport Workers' Federation (ITF), the Public Service International (PSI), the International Metalworkers' Federation (IMF), and the Building and Woodworkers' International (BWI). While most of them do not explicitly mention sustainable development in the description of their mandate, they often have projects in line with Agenda 21.

[21] http://www.ilo.org/ilolex/english/subjlst.htm
[22] http://www.ilo.org/ilolex/english/index.htm
[23] http://www.unep.org/labour_environment/TUAssembly/index.asp
[24] http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=466&ArticleID=5110&l=en
[25] http://www.unep.org/labour_environment/features/trade-unions-project.asp
[26] http://www.unep.org/civil-society/MajorGroups/WorkersandTradeUnions/LabourandtheEnvironment/Strengtheningtradeunionparticipation/tabid/6877/Default.aspx
[27] http://www.global-unions.org/about-us.html
[28] http://www.global-unions.org/framework-agreements.html

Examples of global mobilization by workers and trade unions

Workers and trade unions are skilled global mobilizers, which is manifested for example through global action days for workers' rights. On the World Day for Decent work on 7 October 2009, 472 actions were organized in 111 countries. The Workers' Memorial Day has been celebrated annually for the last 13 years on the 28 April, in memory of workers who have died or been severely injured at work. Trade unions have also mobilized for the recognition of access to water as a human right, globally as well as in local and national contexts. Paragraph 29.11b encourages trade unions to engage with local communities by participating in environment and development activities and promote joint action on problems with common concern. Trade unions struggled in Thailand, Korea and Indonesia for maintaining the public ownership of water services, and in Argentina for the re-municipalisation of water after privatization failed. This work by trade unions in collaboration with civil society networks led to the recognition and address of the right to clean water access and sanitation by the UN General Assembly. Climate change has also become a global priority issue for trade unions, since major social transformation is needed to tackle the root causes of the problem, and communities and workers might suffer the most from the impacts of inaction.

Trade unions in United Nations sustainable development governance

The increased involvement of trade unions in sustainability issues is reflected in the number of trade unions participating in international negotiations and processes. Paragraph 29.11c states that trade unions should play an active role in the sustainable development activities of regional and international organizations, in particular within the United Nations. This happens in the Commission on Sustainable Development, the UN Framework Convention on Climate Change (UNFCCC), the Strategic Approach to International Chemicals Management (SAICM), the UNEP Governing Council, and several processes related to the social and economic dimensions of sustainable development. In some cases trade unions have brought new ideas to the table for intergovernmental environmental policies, such as the 'Just Transition' framework that was proposed by trade unions and was included in negotiation texts in preparation for the UNFCCC COP15 in Copenhagen 2009.[29]Trade unions are also involved in implementation of the Millennium Development Goals, since they recognize full and productive employment and decent work as a fundamental driver for achieving them, in particular MDG1 on eradicating extreme poverty. The global labour movement is active in campaigns for changing the governance of the current economic system, as part of a broader effort to propose integrated solutions to the multiple crises the world is presently going through.

Challenges and Conflicts

High unemployment rates and unequal incomes

Despite strong economic growth that produced millions of new jobs since the early 1990s, income inequality has grown dramatically in most regions of the world and is expected to increase due to the current global financial crisis and the rise in food and energy prices. With unemployment being the highest ever reported with as many as 205 million people out of a job in 2011, support for sustainable solutions including social protection is more important than ever. On current predictions, a further 45 million young people will join the ranks of the unemployed in the coming decade.

[29] UNFCCC (2009). AWG-LCA, sixth session, item 3 (a-e) on the provisional agenda. Bonn 1-3 June 2009. FCCC/AWGLCA/2009/8. See para 4 on "shared vision".

Widespread violations of trade union rights

ITUC is conducting an Annual Survey of Violations of Trade Union Rights, which documents how trade union rights are applied in practice and how they are violated, as well as to what extent national legislation in 140 countries in five continents protects trade union rights. The latest survey paints a picture of workers fighting for greater economic rights and freedom to organize. Many governments and companies respond to such initiatives with repression, sackings, violence, death threats and murder. 90 people were killed in 2010 due to their involvement in legitimate trade union activities, and a further 75 were treated to death. Some 2,500 trade unionists were arrested and 5,000 dismissed. The actual numbers are likely to be higher, since those figures only aggregate based on reported cases. In many countries there is a long way to go before trade unions can enjoy core labour standards, and this is a definite barrier for sustainable development.[30]

Increased risks of marginalization of workers

While "green economy" visions are presented to include opportunities for green jobs, workers and trade unions emphasize that far too little is known about social risks related to the transition. A piecemeal approach to "greening" of economies could result in creating new decent work opportunities for just a few while other work opportunities would disappear. Workers may be badly affected if the transformation to a green economy is not accompanied by adequate social protection and access to new opportunities. Moreover, the financial crisis caused budget deficits at unprecedented levels. The response to such deficits in the form of regressive tax reforms and cuts in public expenditures and pensions could make working families would pay for the crisis twice: first through falling incomes and rising unemployment, and then by loosing public and social services.[31]

Way Forward

Speed up measures for social protection

Specific measures must be taken for improving the situation for workers globally. This is closely interlinked to other sustainability issues. In this regard, the Major Group for Workers and Trade Unions propose in their consolidated contribution to Rio+20 that governments should commit to address the deepening problem of social vulnerability by strengthening social protection. Vulnerability has multiple sources and social protection systems may include income security, unemployment benefits, essential public services with quality, social transfers, health security, adequate nutrition, maternity protection, child benefits, education, housing, etc.

Two initiatives are particularly relevant in relation with the upcoming discussions at UNCSD. First, the UN System Chief Executives Board adopted a Global Initiative for a Universal Social Protection Floor in 2009, which has later been widely endorsed.[32] Heads of State could commit to implement the SPFI. Second, in the context of the discussion on adopting Sustainable Development Goals (SDGs), one of the goals could be to ensure that at least a given proportion of the worlds' workers have decent jobs by a target date, and that all governments as a minimum have an SPFI in place by 2020.[33]

[30] http://survey.ituc-csi.org/
[31] ITUC (2011). *Workers and trade unions' consolidated contribution to the United Nations Conference on Sustainable Development.*
[32] *Factsheet – the UN Social Protection Floor Initiative* http://www.ilo.org/gimi/gess/RessShowRessource.do?ressourceId=14603
[33] ITUC (2011). *Workers and trade unions' consolidated contribution to the United Nations Conference on Sustainable Development.*

Ensure a Just Transition to green economy

The transition to a green economy must be fair, which can be ensured by applying a framework for a Just Transition in line with the trade union proposal for the UNFCCC climate negotiations.[34] A Just Transition needs to be based on meaningful social dialogue, income protection, active labour market policies, sustainable industrial policies, economic diversification, research on potential impacts, retaining, and investments at the local level.[35] A fair and environmentally-friendly tax policy could finance the just transition.

Create decent jobs

Workers from different sectors need to be aware of new innovations and opportunities for greening their activities. Entrepreneurs must be qualified to deliver environmental benefits and economic returns. Technical know-how and entrepreneurial skills upgrading are both fundamental and possible. A map of required skills should be created, and investments should follow to develop those qualifications.

[34]ITUC.*A Just Transition.*http://www.ituc-csi.org/what-s-just-transition.html

[35]Rosemberg, Anabella (2010). *Building a Just Transition: the linkages between climate change and employment.* International Journal of Labour Research, Vol. 2, Issue 2, 2011.

Chapter 30: Strengthening the Role of Business & Industry

Introduction

In practical terms, consensus on sustainable development calls for international cooperation and national leadership to achieve convergence between economic development, social development and environmental protection. In 1992, there were different views regarding the role and contribution of the private sector towards this consensus. Some held the view that business and industry, and trans-national corporations in particular, had to be more regulated in order to better align their incentives with sustainable development objectives. Others pushed for approaches based on incentives and voluntary measures to be adopted by business itself as it saw fit. In spite of this divergence of views, the inclusion of Business and Industry in Agenda 21 as one of the nine Major Groups meant recognition that they had a role to play.

There had been an attempt by the UN Centre for Transnational Corporations to table an Agenda 21 chapter on "Transnational Corporations and Sustainable Development". The proposed chapter included five core programme areas in which "*large enterprises, including transnational corporations, can contribute to the goals of sustainable development*": global corporate environmental management; risk and hazard minimization; environmentally sounder consumption patterns; full-cost environmental accounting; and environmental conventions, standards and guidelines.[1] The proposed chapter was heavy on proposed new regulation and included many goals with targets and timelines.

This approach was rejected and the final chapter 30 included only two programme areas: (A) promoting cleaner production; and (B) promoting responsible entrepreneurship. Both were almost exclusively based on voluntary measures to be taken by business, either on their own or in partnership with other actors. As in the other Agenda 21 Chapters on Major Groups, Chapter 30 includes some references to what governments and international organizations should do in order to implement the goals of the chapter.

Implementation

Business and sustainable development

In the early 1990s, business and industry representatives got involved in the UNCED preparation process through different organizations. The UNCED Secretary General invited a Swiss industrialist, Stephan Schmidheiny, to convey the views of the global business community to the Earth Summit. The participation led to a book entitled *Changing Course: A global business perspective on development and the environment*, published timely before Rio.[2] Schmidheiny took the initiative to create the Business Council for Sustainable Development (BCSD) in 1991, with the idea to represent the business voice in Rio, and to involve the private sector and encourage companies to act as catalysts for change towards sustainable development. In 1995, BCSD merged with the World Industry Council on the Environment and expanded into the World Business Council for Sustainable Development (WBCSD). Today the WBCSD has around 200 members and involves some 1,000 leaders of business from 20 major industrial sectors.[3]National

[1] United Nations, 1992, Trasnnational corporations and sustainable development: recommendations of the Executive Director, Report of the Secretary-General, E/C.10/1992/2.
[2] http://www.wbcsd.org/plugins/DocSearch/details.asp?type=DocDet&ObjectId=NTQ3
[3] http://www.wbcsd.org/templates/TemplateWBCSD2/layout.asp?type=p&MenuId=NDEx&doOpen=1&ClickMenu=LeftMenu

and regional business councils for sustainable development are members of WBCSD's Regional Network.[4]

Another business organization that was important to the involvement of this Major Group in the lead-up to UNCED was the International Chamber of Commerce (ICC). ICC was founded in 1919 and granted the highest-level consultative status with the UN in 1945. It has later evolved into a world business organization with thousands of member companies and associations in each major industrial and service sector.[5] In 1989, ICC started a process to develop a Business Charter for Sustainable Development. This involved engaging a group of business executives to come up with a set of 16 key principles that "provide businesses worldwide with a basis for sound environmental management".[6] The Charter was launched prior to UNCED in 1991, and helped to set the environmental agenda for business and industry in the following decade. Its stated aim is to be "a tool to help companies tackle the challenges and opportunities of the environmental issues".[7]

Since 1992, business and industry have become increasingly aware of the sustainability challenges as well as of the potential of "sustainability" in various forms as a competitive advantage and a marketing tool. A large and growing academic and business literature has tried to make the case for sustainability based on bottom line considerations, putting forward issues such as brand, trust and reputation, in addition to revenue growth and cost reductions, as incentives for business to take up sustainability approaches. In 2010, the UN Global Compact and Accenture released the findings of a large global research study on corporate sustainability, based on 100 in-depth interviews with global leaders and 766 survey responses from Chief Executive Officers (CEOs). The results showed that 93% of the CEOs said they thought that sustainability issues will be critical to the future success of their business. According to the same survey, the main reason for CEOs to take action on sustainability issues was 'brand, trust and reputation'. 72% of the CEOs listed this as one of the top three driving factors, with revenue growth and cost reduction coming second with 44%.[8]

Business and international negotiations on sustainable development

Since 1992, the importance of multinational corporations in affecting economic, environmental and social outcomes has grown. Multinational corporations play an important role in international relations, globalization and the world economy, with some of the world's biggest companies being richer than several UN member states.

In Johannesburg ten years after Rio, attempts by NGOs to bring the topic of trans-national corporations to the negotiation table resulted in the JPoI merely voicing support for some more voluntary action. NGOs then moved their efforts to the International Standards Organisation (ISO) process, a result of which was the ISO 26000 on Social Responsibility (2010). But overall, results on this front have been meagre.

Thus, the approach of the international community to foster business involvement in sustainable outcomes has largely relied on international principles, guidelines, and standards, often drafted by business itself, many of which are voluntary. The WSSD in Johannesburg 2002 also tried to formalize the notion of partnership between the private and public spheres to achieve sustainable

[4] http://www.wbcsd.org/templates/TemplateWBCSD5/layout.asp?type=p&MenuId=NjM&doOpen=1&ClickMenu=LeftMenu
[5] http://www.iccwbo.org/id93/index.html
[6] http://www.iccwbo.org/policy/environment/id1309/index.html; http://www.iccwbo.org/policy/environment/id1307/index.html
[7] http://www.iccwbo.org/policy/environment/id1307/index.html
[8] Lacy et al (2010). *A new era of sustainability.CEO reflections on progress to date, challenges ahead and the impact of the journey toward a sustainable economy*.UN Global Compact & Accenture.

development objectives. It was agreed that the negotiated and government agreed outcomes, called "Type I" outcomes, would be accompanied by voluntary partnerships called "Type II partnerships". Leading up to WSSD, business and industry embraced the concept, while some parts of civil society viewed it with suspicion.[9] Already in Johannesburg, the Business Alliance for Sustainable Development (BASD) launched more than 90 Type II Partnerships under the WEHAB initiative umbrella – Water and sanitation, Energy, Health, Agriculture, Biodiversity, and cross-cutting issues. At CSD-13 in 2005 the Business Action for Water was developed within this framework,[10] and a partnership called Business Action for Energy was launched at CSD14-15 in 2006-2007.[11]

The United Nations Global Compact

The biggest collaboration platform for business and industry currently in place within the UN system is the United Nations Global Compact. Formally launched in 2000, Global Compact is presented as "*a strategic policy initiative for businesses that are committed to align their operations and strategies with ten universally accepted principles in the areas of human rights, labour, environment and anti-corruption*". It comprises over 8,700 participants from 140 countries, out of which over 6,000 are corporate signatories. The reach of the UN Global Compact is expanding (see Figure 1 below).[12]

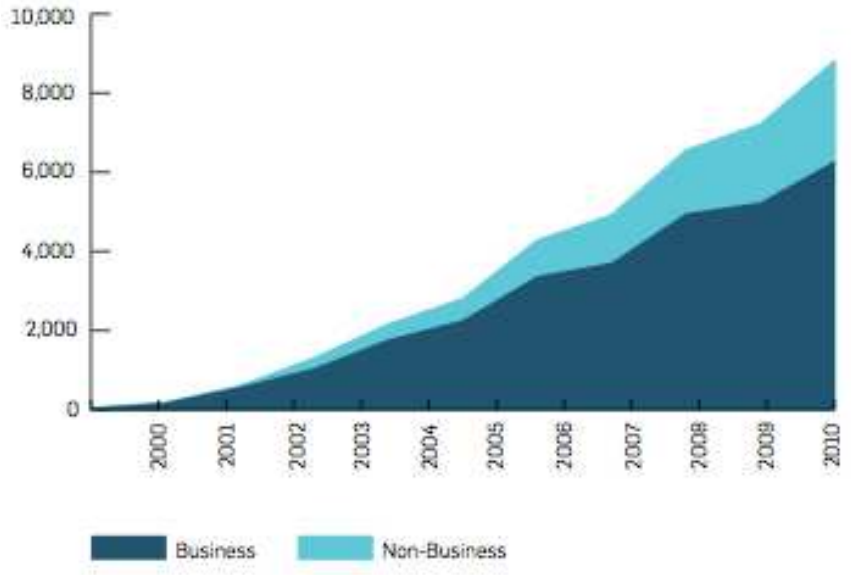


Figure 1. Total Global Compact signatories

Source: Hall, Carrie (2011). United Nations Global CompactAnnual Review, 2010.

In 2010, the Global Compact launched a Blueprint for Corporate Sustainability Leadership, designed to inspire businesses to reach higher levels of performance for sustainability. It provides and action plan for how to integrate the ten Global Compact principles into strategies and operations, how to take action in support of broader UN goals and issues, and how to get the most out of engaging with the UN Global Compact network.[13]

[9] http://www.iisd.ca/wssd/partnerships.html
[10] http://www.wbcsd.org/templates/TemplateWBCSD4/layout.asp?type=p&MenuId=ODYz
[11] http://www.iccwbo.org/bae/id10992/index.html
[12] http://www.unglobalcompact.org/AboutTheGC/index.html
[13] Hall, Carrie (2011). *United Nations Global CompactAnnual Review 2010.*

However, the Global Compact had attracted criticism. In a recent report, the Joint Inspection Unit (JIU), an independent external evaluation body of the UN, stated that: "*on the whole, the Global Compact has been successful in legitimating the progressive and generalized engagement of the United Nations with the private sector, and promoting new partnerships whose effectiveness is yet to be proved. However, it has been less successful in making business participants translate their commitment into real policy change*".[14]

Corporate sustainability reporting

Paragraph 30.10a encourages business and industry, including transnational corporations, to annually report on their environmental records, their energy use and natural resource use. Many companies have subscribed to global initiatives such as the Global Reporting Initiative (GRI), or voluntary industry sector wide initiative such as "Responsible Care". The Global Reporting Initiative started in 1997, clearly inspired by what happened at UNCED. The organization behind it was the Boston-based non-profit CERES, joined by UNEP in 1999 and thereby securing a global platform for GRI.[15] In 2000 GRI released their first Sustainability Reporting Guidelines, and the latest updated version was released in March 2011.[16]

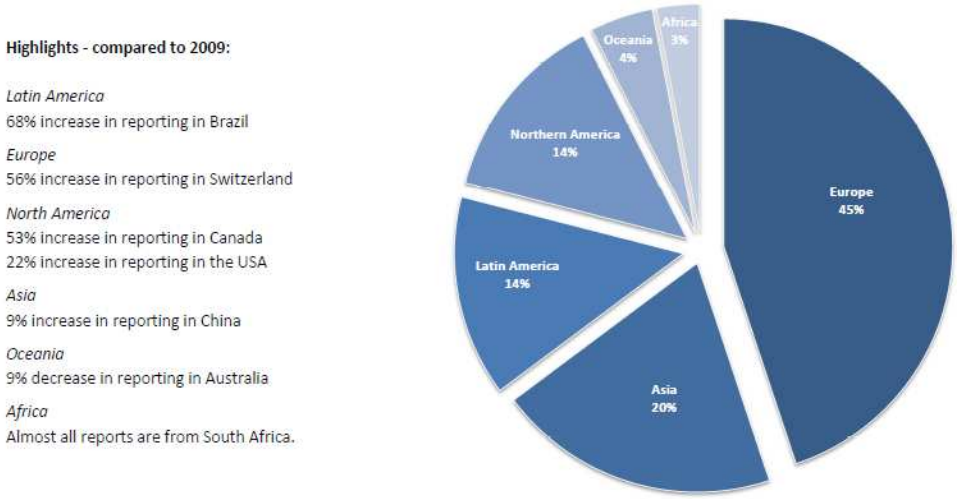


Figure 2. Regional distribution of reports in 2010 in response to the Global Reporting Initiative's Sustainability Reporting Guidelines
Source: GRI Website.

While there has been a rapid increase in the number of companies and organizations reporting - the majority still do not. Of the estimated 82,000 multinational enterprises globally, only some 3,000 regularly issue reports.[17]Reasons include lack of awareness and capacity; established reporting frameworks and indicators and supportive enabling environments. This lack of progress has raised other issues and debates on whether regulation and mandatory reporting is necessary, how to link to financing reporting and assessing the cost/benefits of reporting. This is often seen as a "reporting burden" rather than an opportunity to identify efficiencies and innovations.

[14]United Nations Joint Inspection Unit (2010).United Nations corporate partnerships: The role and functioning of the Global Compact. Geneva 2010.
[15]http://www.globalreporting.org/AboutGRI/WhatIsGRI/History/
[16]http://www.globalreporting.org/ReportingFramework/G3Guidelines/
[17]2011 UNEP-Business and Industry Global Dialogue: Discussion Note for Panelists and Participants (April 2011) - http://www.unep.fr/scp/business/dialogue/2011/discussion_notes/Day_2/7_1_MeasuringProgress.pdf

Efforts for cleaner production

The first programme area in Chapter 30, promoting cleaner production, is today commonly linked together with efforts for sustainable consumption. While consumers are mentioned only twice throughout the 30 paragraphs in Chapter 30, the importance of connecting the issues through a full-cycle approach is increasingly recognized. Paragraph 30.12 states that industry should incorporate cleaner production policies in its operations and investments, also taking into account its influence on suppliers and consumers. Through paragraph 30.15, international organizations were also encouraged to increase education, training and awareness activities relating to cleaner production

It seems fair to say that the data that would allow for a monitoring of this chapter of Agenda 21 are lacking. This is perhaps a direct consequence of the voluntary nature of the actions suggested in chapter 30. In the absence of reliable data at the global level, assessments of this chapter have to rely on specific surveys, or on data produced by business and industry itself on a voluntary basis. Standardization of data and reporting is a clear issue in this domain. Although international reporting initiatives do have templates for reporting, they are far from being universally adopted, offering at best views of samples that are biased towards the most progressive and large firms.

Some achievements of the cleaner production programme's are put forward in the 22 sectoral reports that UNEP launched in 2002. The cleaner production programme has expanded to areas such as product design, life-cycle approaches and consumption. Achievements include the regional round tables on cleaner production and, at the national level, the increase in the number of UNIDO/UNEP National Cleaner Production Centers worldwide. However, while many firms worldwide have taken efforts to improve their production practices and some industries have become less polluting and less resource-intensive in absolute terms, generally speaking gains have not been sufficient to stop or invert the trend in consumption of resources and waste generation. Many parts of industry, particularly small and medium-sized enterprises (SMEs), have not yet adopted cleaner production. Concepts such as life-cycle thinking and cradle to cradle approach are still not common among business in general.

Responsible entrepreneurship

The second programme area in Chapter 30 includes many paragraphs that formulate responsibilities for business and industry. Paragraph 30.22 encourages business and industry to establish worldwide corporate policies on sustainable development. National legislation for sustainable development in industries and at workplaces are often weaker in developing countries. It is notable that some companies take responsibility to improve the conditions in all parts of the world where they are active. However, others may move overseas for the benefits of not having to comply with strong national legislations and associated costs, for example regulatory regimes to promote environmental protection.

Paragraph 30.23 encourages large business and industry to establish partnership schemes to support SMEs with experiences, know-how and other needs they have. Some transnational corporations have initiated such projects, but the practice is far from universal. Likewise, businesses sometimes help promote entrepreneurship in the formal and informal sectors, with a special focus on women entrepreneurs, in line with paragraph 30.24.

Paragraph 30.26 aims to ensure responsible and ethical management of products and processes, increased self-regulation, and openness and dialogue with employees and the public about business planning and decision-making. Internet has made it easier for companies to post their internal guidelines and ethics online, and today it is common and often demanded by customers and others.

Government support for sustainable enterprises
Governments can play an important role in encouraging the establishment and operations of sustainably managed enterprises. Many governments have established programmes to encourage new businesses and cultivate entrepreneurship with sustainability profile. Support for new businesses may include training sessions on how to transform an idea to profitable business, including administrative support and facilitation of investment decisions. It has also become common for governments to support training in the environmental aspects of enterprise management and to provide apprenticeship schemes for youth.

Challenges and Conflicts

Many of the challenges involved with chapter 32 relate to the broader question of the validity of relying primarily on voluntary approaches to solve issues associated with the impacts of business and industry on sustainability. In that sense, it is not only what has been done since 1992 on improving resource and energy efficiency in production processes and promoting sustainable entrepreneurship that has been questioned, but whether other areas of actions would be necessary.

Uncertainty regarding effectiveness of voluntary initiatives
Paragraph 30.8 encouraged governments to put in place a mix of instruments for cleaner production, while also encouraging voluntary private initiatives. One of the key challenges facing international rule-making, institutions, and policy-development is the relative lack of information on the effectiveness and profitability of voluntary initiatives in complementing formal governmental policy and rule making. This issue is linked with emerging discussions on the potential impact and scope of corporate responsibility initiatives, which must ultimately be supported by a clear business case.

Requiring of firms that they practice Corporate Social Responsibility (CSR) has been a recurrent call coming from UN events ad decisions. However, the take-up, nature, and the impacts of CSR are eminently variable across sectors and firms, and have not been comprehensively assessed globally.

Many critics of voluntary initiatives state that such approaches are simply a means of corporations seeking to avoid more strict government regulation for sustainability which includes enforcement. For example, the Corporate Europe Observatory (CEO) has reported that industry are actively using lobbying techniques to promote industry self-regulation over government-enforceable mechanisms.[18] This can often result in companies underperforming on sustainability goals. Therefore, the much-needed participation of private sector in resolving issues relating to sustainable development (e.g. cutting carbon emissions) is lacking.

Lack of incentives for sustainable business practices
Since before UNCED, the case for sustainability issues to be incorporated in business has largely relied on finding so-called "win-win" cases, i.e. cases where adopting more environmentally friendly production processes or products allow business to reduce costs while improving its environmental impact. Such cases are the easiest to handle, because the corresponding changes make financial sense for companies. Other, non win-win cases are much harder to solve in the absence of direct regulation. The call for reflecting externalities in accounting and pricing systems included in Agenda 21, has not witnessed rapid or broad implementation. While the need to further explore the concepts and methods to achieve this has often been used as an argument to

[18]Corporate Europe Observatory.Corporate Campaign to Corrupt the Kyoto Protocol Continues After COP-6,*Corporate Europe Observer*, Issue 8, April 2001.

delay action on this front, [19] reluctance and lobbying by business to oppose regulation may well be a better explanation for slow progress. At the same time, some industries have explicitly and genuinely called for longer-time clarity on price signals, for example carbon prices, to allow them to make the case for sustainable solutions.

Sustainability has not yet managed to permeate all elements of core business, processes and systems. Small and medium sized enterprises (SMEs) are still to be reached in a meaningful way. CEOs surveyed in the UN Global Compact CEO Survey 2010 CEOs saw implementation of strategies across supply chains and subsidiaries as the top barrier to the full integration of sustainability.[20]

Rebound effects

Critics of the approach centered on clean production at the expense of other types of actions have argued that such an approach fundamentally does not solve issues of over-consumption of resources, due to rebound effects – energy or resources saved through more environmentally friendly products or services are used in additional consumption of products or services that may not be as clean. At the macro-economic level, such arguments are supported by unrelenting growth in resource consumption since the beginning of the 20th century, which is when data become meaningfully available.

Greenwash and bluewash

It has become increasingly common that the resourceful private sector provides funds for non-governmental organizations, the United Nations and others to carry out sustainability projects. In some cases, companies use this kind of charity projects as a way to hide their own unsustainable practices instead of taking action in their own backyard – thus engaging in so-called greenwashing activities, or "bluewashing" (when it happens in the context of the UN). Futerra, a UK-based sustainability communications think-tank, define greenwashing as an environmental claim which is unsubstantiated (untrue) or irrelevant (a distraction). Furterra reports that "*greenwash is growing. The Advertising Standards Authority in the UK is upholding more and more complaints against advertising that can't live up to its green bluster. Around the world regulators are trying to keep up, and the USA's Federal Trade Commission has brought forward to 2008 its plan to review their environmental marketing guidelines. France has just announced new guidelines and the UK is reviewing the advertising Green Claims guidance."*[21] This is a threat to other businesses that do take sustainable development seriously, since it raises suspicions and affects also their perceived credibility negatively.

The Major Groups models tends to confuse the private sector with civil society

Business and industry belong to the private sector, which is clearly separate from civil society in terms of interests, motives, and power status, as well as in terms of relations and potential conflicts with other segments of society. However, this is often disregarded through careless references to "civil society" as a whole, including business. While acknowledging the important role of the private sector in shaping the future of the world and managing the sustainability challenge, the different roles of business and other civil society components deserve to be recognized for what they are.

[19] http://economics.fundamentalfinance.com/negative-externality.php

[20] Lacy et al (2010). *A new era of sustainability.CEO reflections on progress to date, challenges ahead and the impact of the journey toward a sustainable economy*.UN Global Compact & Accenture.

[21] Futurra. The Greenwash Guide (2008) - http://www.futerra.co.uk/downloads/Greenwash_Guide.pdf

Way Forward

The way forward for ensuring that business and industry positively contributes to more sustainable outcomes is, as it was in 1992, a subject of debate and of a wide spectrum of opinions. Whether voluntary approaches by themselves are able to bring business and industry as a whole closer to sustainable practices globally, or whether stronger regulation of business practices from resource use to pollution control and pricing to marketing is needed, is intensely debated and no consensus exists in this area.

Uncontroversial actions in this domain include increased support for SMEs on issues related with sustainability; educational reforms in academic institutions and companies to include sustainability in education material;

Chapter 31: Scientific & Technological Community

Introduction

Chapter 31 recognizes the important role of the scientific and technological community in Agenda 21 implementation and covers in detail how scientists and technologists ("which includes, among others, engineers, architects, industrial designers, urban planners and other professionals and policy makers"[1]) have a key role to play to help achieve sustainable development.

A number of scientific as well as technological international bodies paved the way for its constituency to be granted status as one of the nine Major Groups. The Scientific community participated actively in the UNCED preparatory process especially through the International Council for Science (ICSU), a non-governmental organization founded in 1931 to promote international scientific activity in the different branches of science and its application for the benefit of humanity.[2] ICSU was formally invited by the UN to act as principal scientific adviser to the UNCED Secretariat, and its representatives participated in official and unofficial preparatory meetings. In November 1991, ICSU organized an international conference in Vienna to define the Agenda of Science for Environment and Development into the 21st Century (ASCEND 21). The final version of Agenda 21 includes many sections that overlap considerably with the positions taken at ASCEND 21.[3]

Engineering groups also showed a major interest in UNCED and Agenda 21, and as a result of their organized efforts, 'Technology' was added to the Major Group and Chapter 31 alongside science. In 1991, the World Federation of Engineering Organizations (WFEO) developed and adopted the Arusha Declaration[4] on the future role of engineering, and decided that it needed to be transmitted to UNCED. The declaration was developed based on studies of *Our Common Future* and other documents and provided helpful guidelines that engineers could use for projects in line with sustainable development.[5] In order to get a stronger voice in the UNCED process, WFEO joined together with the International Federation of Consulting Engineers (FIDIC) and the International Union of Technical Associations (UTAI) to form the World Engineering Partnership for Sustainable Development (WEPSD). WEPSD argued that engineering is uniquely placed to make a significant contribution to sustainable development, since its activities shape the world through the management of technical systems and innovation as well as the design of products and process.[6]

Chapter 31 is closely linked to other chapters of Agenda 21 that also address the role of science and technology, especially Chapter 34 on "Transfer of environmentally sound technology, cooperation and capacity-building", Chapter 35 on "Science for sustainable development", and Chapter 40 on "Information for Decision-Making". Moreover, implementation of the topical

[1] Agenda 21, paragraph 31.1
[2] http://www.icsu.org/about-icsu/about-us/a-brief-history
[3] ICSU (2006). *ICSU and Sustainable Development: 1991-2006 and beyond.* http://www.icsu.org/publications/about-icsu/icsu-sustainable-development-2006/2651_DD_FILE_ICSU_and_Sustainable.pdf
[4] WFEO (1992) *Arusha Declaration*, statement by WFEO to the UNCED Conference, 1992. Available at http://www.wfeo.org/documents/download/arusha_declaration.pdf.
[5] http://www.naturaledgeproject.net/ESSPCLP-Principles_and_Practices_in_SD-Lecture1.aspx
[6] http://coe.uncc.edu/~hhilger/aaaSustainable%20Design_08_&_on/History/Engineering_Timeline.pdf

chapters of Agenda 21 must be based on scientific knowledge and in many cases the use of environmentally sound technology. The review of Chapter 31 focuses on the state of implementation for the two priority issues in Chapter 31: (A) Improving communication and cooperation among the scientific and technological community, decision makers and the public, as well as (B) Promoting codes of practice and guidelines related to science and technology. The first programme area recognizes the mutual responsibility of three important groups in society to learn from each other, respect and support each other's work, and to join forces for achieving sustainable development. The second programme area calls for the science and engineering professions to develop codes of practice and ethical guidelines that implicitly include recognition of sustainable development concerns. More than anything else, Chapter 31 aims to improve the ways in which scientists and technologists interact with each other and with others, in the process of sound scientific knowledge production and technological innovation for sustainable development.

Implementation

Major Group Implementation

Scientists contributing knowledge for Agenda 21 implementation
Scientific communities in most countries worldwide have made significant contributions to advancing the understanding of the problems identified in Chapter 2-22 of Agenda 21, as well as generated new knowledge towards solutions. On many of the sustainability issues, new research initiatives have been launched and undertaken at the national, regional and global levels. The CSD Partnership Database, which lists voluntary multi-stakeholder initiatives contributing to the implementation of Agenda 21 and its follow-up documents from Rio+5 and Johannesburg, contains 67 registered partnerships on science.[7]

Engineers responding to the sustainability challenge
Since UNCED, engineers and technical innovators have strengthened the trends for moving towards more sustainable engineering to ensure that energy and resource use does not compromise the natural environment or the ability of future generations to meet their needs. Chapter 31 makes the technological community responsible to inform the public and decision-makers better. Engineers and technical innovators generate new ideas and know-how that may be used in policy and strategy for sustainable development. There have been efforts to develop better approaches for considering the environmental cost, impacts and conditions throughout the life cycle of technical projects, and to make sustainability aspects part of technology education. The technological community is involved in environmental engineering, green building projects, eco-technology. Engineers work to address several sustainability challenges in thematic chapters of Agenda 21, such as water supply, waste management, transportation, energy development, improving industrial processes, and recommending the appropriate and innovative use of technology.

Increased collaboration between scientists
The role of science has evolved in the two decades since UNCED, and today the scientific community is working to meet more complex tasks than ever before. Scientists have shown that the sustainability challenges are even greater than in 1992 and rapidly growing more serious. In situations when risks are high, values are disputed, decisions urgently required, but knowledge

[7] CSD Partnership Database: http://webapps01.un.org/dsd/partnerships/public/simpleSearch.do?dispatch=search&keywords=science&partnerFreetext=&implementedCountries=&subRegion=&search=Search

insufficient, there is demand for post-normal science. In such cases, no single discipline or specialized research can provide the full answers.[8]

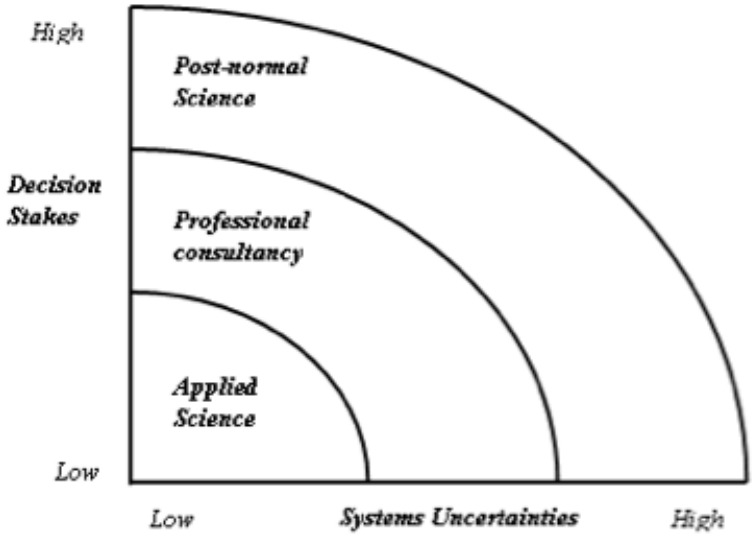


Figure 1. Problem-solving strategies
Source: Funtowicz and Ravetz (1993) "Science for the post-normal age". Futures, September 1993:745.

The scientific community has responded to this by making research projects with collaborators from different disciplines more common, in line with the call in Chapter 31 for strengthening multidisciplinary approaches in science. Information and communication technologies make it easier for scientists around the world to communicate and collaborate to an extent never experienced before, across geographical as well as disciplinary borders. With the growth of complexity and transformation of society, the trend towards increased interdisciplinarity is likely to continue.

Transdisciplinary research for increased policy-relevance
In addition to the increased collaboration between different academic disciplines, the last two decades have seen an occurring trend of research that goes beyond academia and incorporates non-academic thought styles in knowledge production. While the modern industrial society is changing towards a post-modern information-, knowledge-, risk- and network society, there is also a change from Mode-1 science to Mode-2 knowledge production.[9] Mode-2 research is characterized by transdisciplinary collaboration between scientists and practitioners, its focus on real-life problems and the development of comprehensive, multi-perspective, common-good oriented and useful approaches to relevant issues in the real world.[10] Since no absolute, non-biased knowledge is available when it comes to sustainable development, transdisciplinary research for sustainability is directed by normative, value-guided ideas. Sustainable development governance requires policy makers to take scientific expertise merged with public values and

[8] Funtowicz, S & Ravetz, J (1993, September). *Science for the post-normal age.* Futures, page 739-755.
[9] Nowotny, H, Scott, P & Gibbons, M (2001). *Re-thinking science. Knowledge and the public in an age of uncertainty.* Polity Press
[10] Hessels, L & van Lente, H (2008). *Re-thinking new knowledge production: A literature review and a research agenda.* Research Policy, no 37, pp 740-760.

preferences into account for legitimate decisions. In transdisciplinary science, research quality is controlled by the applicability of results and its communication to stakeholders.[11]

Scenarios assisting decision-making in times of uncertainty

In order to meet the challenges of planning for an unpredictable future, scientific methods and methodologies have changed in the past two decades. Mixed methods research that combines quantitative and qualitative data has become more common.[12] A scientific approach that has become increasingly popular is the development of scenarios, which can be useful when the problems as well as the desired future state are ill defined, when there is a need to accept the complexity and not pretend that we know more than we do. Based on storyline-driven modeling, scenarios that are exploratory, forecasting, or normative aim to illustrate alternative future states. Scenarios are developed on global, regional, national and local levels and intervene in both macro-scale and micro-scale contexts today.[13] They have become popular in policy-making for sustainable development, as a strategizing tool that explores what would happen if business-as-usual continues or if we steer the development in different directions. Scenarios can be understood as co-production of knowledge by facilitating collaboration between the scientific and technological community, policy-makers and the public.[14]

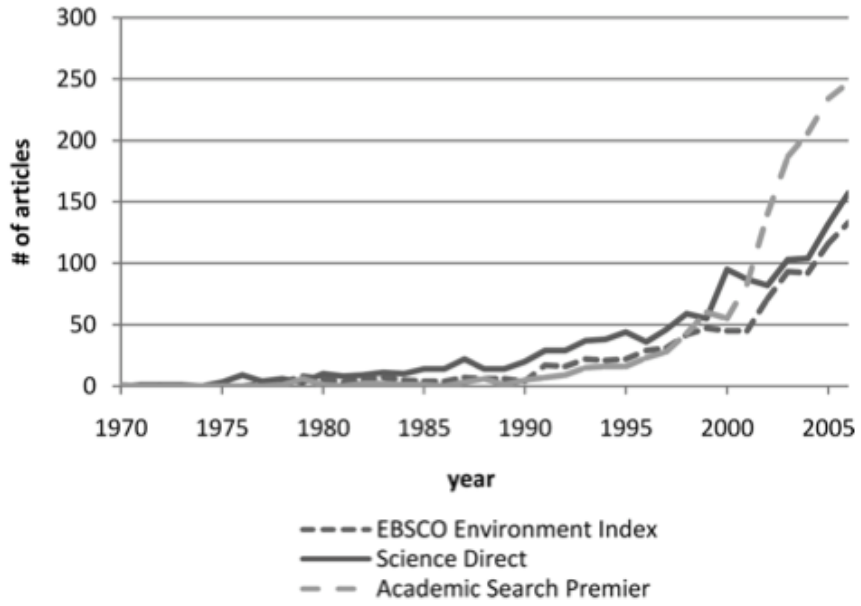


Figure 2.Academic journal articles with "Scenarios" in title

Source: Pulver, S & VanDeveer, S (2009, May). *"Thinking about Tomorrows": Scenarios, Global Environmental Politics, and Social Science Scholarship.* Global Environmental Politics 9:2.

[11] Pohl, C (2011). *What is progress in transdisciplinary research?* Futures, no 43, pp 618-626.
[12] Cresswell, J. & Plano Clark, V. (2007). Designing and conducting mixed methods research. Sage Publications Ltd., London.
[13] Garb, Y., Pulver, S. and VanDeever, S. (2008). *Scenarios in society, society in scenarios: toward a social scientific analysis of storyline-driven environmental modeling.* Environmental Research Letters. No 3, 2008. IOP Publishing. stacks.iop.org/ERL/3/045015
[14] Pulver, S & VanDeveer, S (2009, May). *"Thinking about Tomorrows": Scenarios, Global Environmental Politics, and Social Science Scholarship.* Global Environmental Politics 9:2.

International Implementation

Scientific advisory bodies in the UN

Paragraph 31.4(d) asks the international community to strengthen science and technology advice to the highest levels of the UN and other organizations. Many UN bodies have reached out to the scientific community and involved them by setting up scientific advisory bodies and linking their work to policy processes. Some were established already before UNCED, such as the Intergovernmental Panel on Climate Change (IPCC), which has played a major role in putting and keeping climate change on the international agenda.[15] Others are new, such as the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), currently under development following a decision of the UN General Assembly in 2010. IPBES will be operational in 2012 and is expected to play a similar role in respect of biodiversity and ecosystem services.[16] The International Resource Panel (IRP) launched in 2007 is expected to provide scientific impetus for decoupling resource use and economic growth from degradation of the environment.[17] The Scientific and Technical Advisory Panel for the Global Environment Facility (STAP) provides objective, strategic advice on GEF policies, programs, and operational approaches.[18] The United Nations Environment Programme (UNEP) has contributed to the establishment of all the bodies mentioned above and acts as the convener for a number of scientific advisory groups.

UN commissioned assessments for sustainable development

Scientific global assessments have become increasingly common since UNCED, as a tool for improving communication and cooperation among the scientific and technological community, decision makers and the public, in line with the first programme area of Chapter 31. Several UN bodies and international organizations have mandated scientists to join together for multidisciplinary mapping and evaluation of the state of the environment and aspects of sustainable development, often accompanied with future scenarios.[19] A growing number of assessments have been mandated, and they are complementary to each other since they apply different methodologies and processes. The scientific products are supposed to be policy-relevant and to inform the public. In later years, it has become increasingly common that not only scientists but also other major groups and stakeholders get involved in conducting integrated assessments in transdisciplinary collaboration, although it is still the responsibility of the scientific community to guarantee the credibility of results. Taken together, the assessments provide an extensive picture of the current state of knowledge on various aspects of sustainable development. The current trend is that assessments are no longer limited to describing the problems, but aim at suggesting workable solutions.[20]

Example: Millennium Ecosystem Assessment

One example of a large-scale global change scenario effort is the Millennium Ecosystem Assessment (MA). It was proposed in 1998, and in 2000, UN Secretary-General Kofi Annan called for an MA that would map the consequences of ecosystem change for human well-being and determine the action needed from a scientific basis. The assessment process started in 2001,

[15] http://www.ipcc.ch/organization/organization.shtml
[16] http://www.ipbes.net/about-ipbes.html
[17] http://www.unep.org/resourcepanel/Introduction/tabid/54040/Default.aspx
[18] http://www.unep.org/stap/AboutSTAP/tabid/2903/Default.aspx
[19] UNEP (2008, December). *Overview of the environmental assessment landscape at the global and regional levels.* Note by the Executive Director. UNEP/GC.25/INF/12
[20] Kok, M. et al (2009). *Environment for Development – Policy Lessons from Global Environmental Assessments.* Report for UNEP. Netherlands Environmental Assessment Agency (PBL).

involved more than 1,360 scientists worldwide, and the main results were released in 2005. The MA is considered groundbreaking in its comprehensiveness and scope of analysis, as well as in its incorporation of multi-stakeholder perspective into the scenario development process.[21] However, one of the weaknesses of the MA was that it did not have much direct impact on decision-making and policy, especially in developing countries. This points to a divide between developers and users of the scenarios, since policy-makers or planners could not readily use the product.[22] In line with Chapter 31's Programme area B, many of the assessments have adopted ethical guidelines for ensuring scientific credibility and policy relevance, which all actors involved must sign on to.

UNESCO's Programme on Ethics of Science and Technology

In line with Programme area B in Chapter 31 on promoting codes of practice and guidelines related to science and technology, UNESCO created a Programme on Ethics of Science and Technology in the 1990's. The Programme addresses the concern that unbridled scientific progress is not always ethically acceptable, and that rapid scientific development is not necessarily matched by broader dialogues on the impacts it may have. UNESCO started a multidisciplinary forum for reflection by establishing an International Bioethics Committee (IBC) in 1993.[23] Two new bodies were added in 1998, the Intergovernmental Bioethics Committee (IGBC)[24] and a World Commission on the Ethics of Scientific Knowledge and Technology (COMEST). COMEST is mandated to formulate ethical principles that could provide decision-makers with criteria that extend beyond purely economic considerations, and focuses on science ethics, environmental ethics, and the ethical issues related to emerging challenges and technologies.[25] UNESCO also runs an ethics education programme, produces publications on the topic, organizes a series of ethics conferences, and hosts a Global Ethics Observatory (GEObs), a system of databases with worldwide coverage.[26] UNESCO's standard-setting activities for promoting shared values and establishing universal bioethical guidelines have included the Universal Declaration on the Human Genome and Human Rights endorsed by the UNGA in 1998,[27] the International Declaration on Human Genetic Data from 2003,[28] and the 2005 Universal Declaration on Bioethics and Human Rights.[29] An Inter-Agency Committee on Bioethics was established in 2004 and UNESCO serves as the permanent secretariat.[30]

National and regional implementation

National committees on ethics for science

Chapter 31 paragraph 31.10b promotes the establishment of national advisory groups on ethics to develop common values between scientific communities and society. Many countries have set up ethics committees that deal with reviewing research protocols on various issues that may be sensitive. An area where such advisory groups are especially common is in the field of bioethics. The Universal Declaration on Bioethics and Human Rights from 2005 advocates the

[21] Reid W (2006). *Millennium Ecosystem Assessment: Survey of Initial Impacts.* http://www.millenniumassessment.org/documents/Document.798.aspx.pdf
[22] Wells M P, Grossman D and Navajas H (2006). *Terminal Evaluation of the UNEP/GEF Project 'Millennium Ecosystem Assessment'.*
[23] http://www.unesco.org/new/en/social-and-human-sciences/themes/bioethics/international-bioethics-committee/
[24] http://www.unesco.org/new/en/social-and-human-sciences/themes/bioethics/intergovernmental-bioethics-committee/
[25] http://www.unesco.org/new/en/social-and-human-sciences/themes/science-and-technology/comest/
[26] UNESCO (2008). Ethics of Science and Technology at UNESCO. Division of Ethics of Science and Technology, Sector for Social and Human Sciences (brochure).
[27] http://www.unesco.org/new/en/social-and-human-sciences/themes/bioethics/human-genome-and-human-rights/
[28] http://www.unesco.org/new/en/social-and-human-sciences/themes/bioethics/human-genetic-data/
[29] http://www.unesco.org/new/en/social-and-human-sciences/themes/bioethics/bioethics-and-human-rights/
[30] http://www.who.int/ethics/about/unintercomm/en/index.html

establishment of independent and multidisciplinary ethics committees at national, regional, local or institutional levels.[31] Many states that have signed the Declaration turned to UNESCO for technical support in establishing bioethics committees that are involved in national policy-advice, public debate and education for defining national standards and/or legislation in the field. UNESCO has an Assisting Bioethics Committees (ABC) project with the main objective to facilitate the establishment of national bioethics committees and enhance their capacities. Examples of countries that established such committees in 2009 are Colombia, Oman, Mali, Jamaica, Ghana, and El Salvador. Some regional bioethics information and documentation centers have also been established and strengthened by UNESCO.[32]

Sustainable development in university curricula

Paragraph 31.10c called for the integration of development and environmental ethical issues into education curricula and research priorities. In many countries, governments have made it compulsory for public universities to adopt sustainable development strategies. These often include the obligation to add sustainable development as a crosscutting issue in research and in all educational activities, including engineering curricula. While economic rationality, ethical reasoning and environmental sustainability can easily be fitted into the syllabus, it needs to happen in all engineering education rather than in the small percentage of universities that applies the practice today. There is also a general need for more effective ways of incorporating social sustainability in engineering curricula.[33]

Governments seeking scientific advice for decision-making

Paragraph 31.4c asks governments to improve scientific input to negotiating international agreements. It has become more common that governments prepare their delegations for intergovernmental negotiations by commissioning researchers to produce background studies on relevant topics on the agenda. However, different aspects of sustainable development are often scattered across many ministries in the national government, and this is reflected in international institutions, which makes transdisciplinary collaboration less common on those levels than in local governance. An important need for addressing this is by improving the position of natural science, social science and technology in the hierarchy of national government institutions, which would in turn improve its role in the international hierarchy.[34] In some cases governmental agencies and ministries employ researchers for producing scientific reports relevant to the policy agenda. In other cases such services are provided by external agents, such as universities, research institutes, independent consultants, think-tanks, non-governmental organizations, or others with relevant expertise. Paragraph 31.4f calls for improved cooperation between government and private research sectors. In all cases there is a need to apply source criticism and judge the degree of advocacy versus independence and scientific objectivity of research results. Think-tanks and NGOs are often proactive in delivering their policy-relevant services, and can become effective ideological change agents by legitimizing discourses for certain policies through their integration into policy networks.[35]

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[31] http://www.unesco.org/new/en/social-and-human-sciences/themes/bioethics/assisting-bioethics-committees/
[32] UNESCO (2010, July). *Assisting Bioethics Committees (ABC) Project.* SHS/EST/ABC/03/REV.2.
[33] El-Zein, A., Airey, D., Bowden, P., Clarkeburn, H. (2008). *Sustainability and ethics as decision-making paradigms in engineering curricula*. International Journal of Sustainability in Higher Education, Vol. 9 Iss: 2, pp.170 – 182.
[34] McKellar, B (2011, June). *Workshop Report.* Rio+20 regional workshop for Asia & the Pacific, 16-18 April 2011 in Kuala Lumpur. ICSU Regional Office for Asia and the Pacific. http://www.icsu.org/asia-pacific/events/events/rio-20
[35] Pautz, H. (2011). *Revisiting the think-tank phenomenon.* Public Policy and Administration, 26:419. http://ppa.sagepub.com/content/26/4/419

Government support for research dissemination
Paragraph 31.4e calls governments to improve programs for disseminating research, including transfer of skills, sharing data, and non-technical publications. Governments support the dissemination of research results with full data share for example by establishing statistical databases where academia can add their findings or get access to general and specific data for their research. A precondition for global statistics and comparisons is often that Governments assist by providing data and information for international databases. This happens a lot but improvement is needed in other areas. Most governments also provide some kind of support for spreading research results in a communicative way that is accessible and can be understood by the public. The internet has proven a useful tool for this.

Gender gap in science
Paragraph 31.4g asks governments to promote the role of women in science and technology. National data for comparable statistics on women in science is often limited, such as in North America where no data is available for calculating a regional average. While the gender gap in most parts of the world is smaller than in 1992, women still account for a minority of the world's researchers overall.[36] The total number of researchers has increased in the world. From 2002-2007, the increase in developed countries was 8.6%, or from 4.0 to 4.5 million. In the same five years, the number of researchers in developing countries increased from 1.8 to 2.7 million.[37]

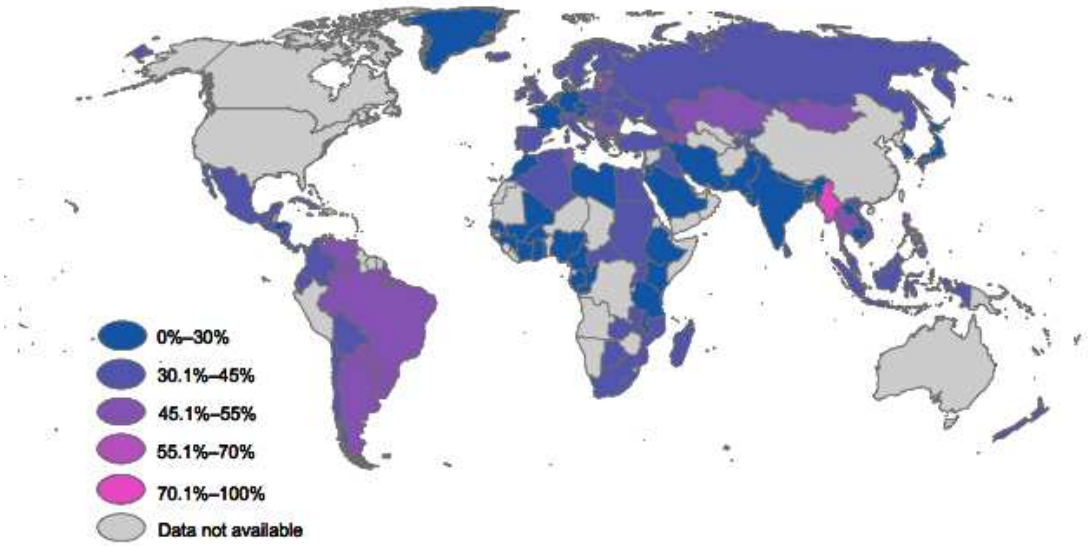

Figure 3. Women as a share of total researchers, 2009 or latest available year
Source: UNESCO Institute for Statistics, July 2011.

Challenges and Conflicts

Conflicting views in sustainability science
Sustainable development can be defined in very many different ways, and there is no consensus among scientists on the exact meaning of the concept in terms of what should be sustained, what

[36] http://www.uis.unesco.org/FactSheets/Documents/FS14-women-2011-en2.pdf
[37] http://www.uis.unesco.org/ScienceTechnology/Pages/default.aspx

should be developed, for how long, and in what way.[38] The social dimension of sustainable development can include both physical and non-physical aspects and focus on sustainability for collective societies or individual justice.[39] The goal for ecological development can be strong sustainability where the natural biophysical capital must be kept intact, or weak sustainability in which human created capital may be counted as a manufactured substitute for the natural.[40] Green economy is by some seen as a zero-sum game, while others consider continued growth a possible and desirable development goal.[41] There are technocentric and anthropocentric versus ecocentric versions of sustainability science, in which one camp believes in and conducts research for technological quick-fix solutions within the industrial society, and the other rejects that technology will be able to solve all problems and investigates how to bring about a complete paradigm shift.

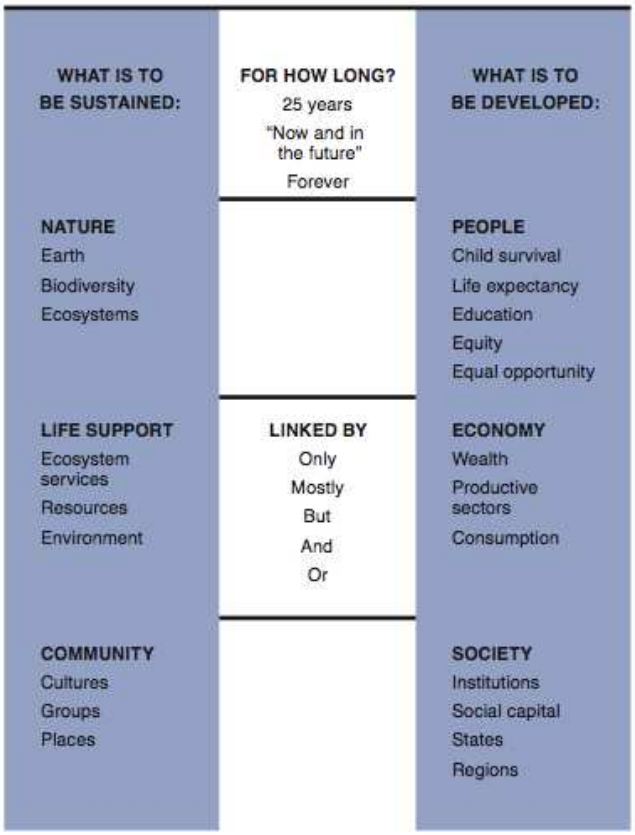

Figure 4. Definitions of sustainable development,. Common concerns, different emphases.
Source: US National Research Council, Policy Division, Board on Sustainable Development (1999) *Our Common Journey: A Transition Toward Sustainability*. National Academy Press, Washington, DC.

[38] Kates, Robert; Parris, Thomas; Leiserowitz, Anthony (2005). *What is Sustainable Development? Goals, Indicators, Values and Practice.* Environment: Science and Policy for Sustainable Development, Volume 47, Number 3, pages 8–21.
[39] Dempsey, N. et al (2009). *The Social Dimension of Sustainable Development: Defining Urban Social Sustainability.* Sustainable Development 2009.
[40] Rees, W. and Wackernagel. M. (1996). *Urban Ecological Footprints: Why cities cannot be sustainable and why they are a key to sustainability.* Environmental Impact Assessment Review 16: pp. 223 – 248.
[41] Hornborg, A. (2003). *Cornucopia or Zero-Sum Game? The Epistemology of Sustainability.* Journal of World-Systems Research IX, no. 2, 2003, pp. 205-216.

Weak sustainability, ecological modernization and technocentric views have dominated the UN and politics in most countries, since they are closer to the way western societies are functioning and represent the mainstream modes of thought that have been spread through globalization. In effect, more funding is available for the dominating field and contributes to growing power imbalances. On the other hand, indigenous cultures and traditional knowledge systems with non-anthropocentric worldviews promote strong sustainability, and question the fundamentals of the technological society and its suggested quick-fix solutions. In order to avoid the risk of science and technology contributing to the problem, it is important to consider who decides what is legitimate knowledge, for whom research is conducted, and what the purpose of knowledge production and problem solving is.

Brain drain and digital divide

Inequalities between science in the North versus the South is not limited to research topics and agendas. Knowledge and worldview dichotomies are exacerbated by the deepening 'digital divide' created by the imbalance in access to information and communication technologies. 'Brain drain' is another trend adding to the gap. Students who cannot get access to high-quality education in their home countries often travel abroad to study, and many qualified scientists choose to leave low income countries for advancing their careers.

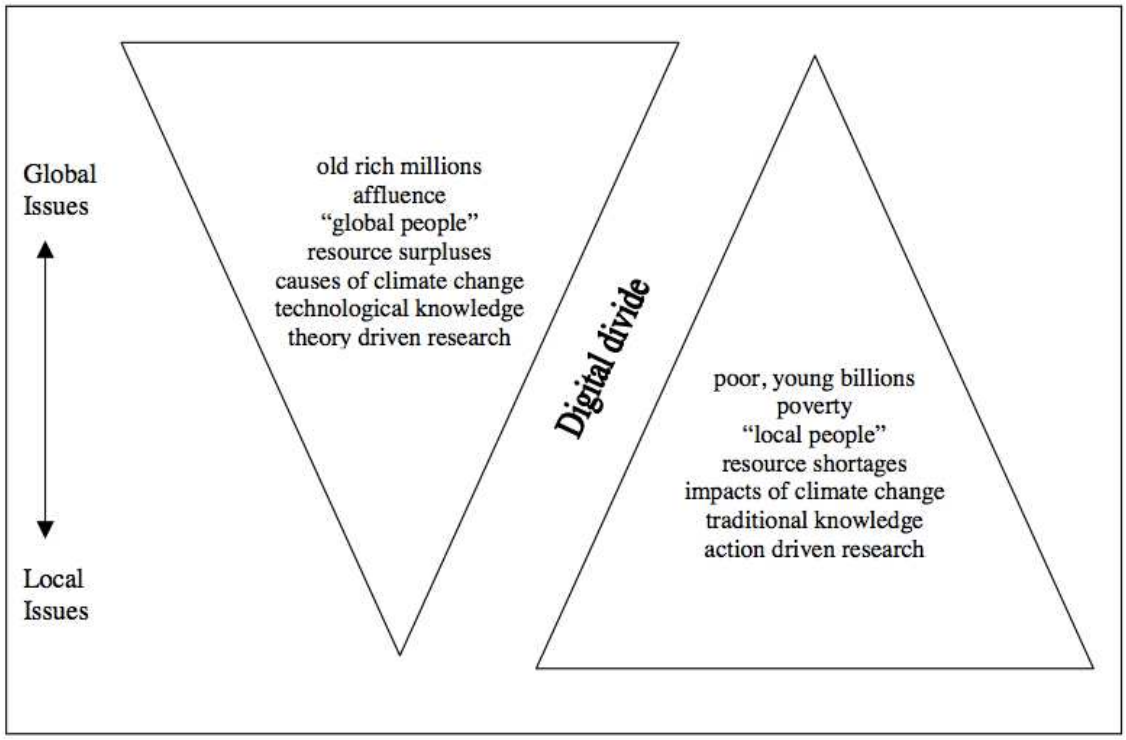

Figure 5. Sustainability science within a divided world

Source: Kates, Robert W. *et al* (2000). *"Sustainability Science."* Research and Assessment Systems for Sustainability Program Discussion Paper 2000-33. Cambridge, MA.

Gaps between science, policy and implementation

Two decades after UNCED, most scientific reports on trends related to sustainable development make clear that the overall situation has become worse than ever. We are transgressing planetary boundaries that have kept civilization safe for the last 10 000 years, and humans are now the most significant driver of ongoing global environmental change. Chapter 31 was an attempt to bridge the gap between science and policy-making in intergovernmental and national governance.

Despite the serious warnings from the scientific community that business-as-usual cannot continue, decision-makers respond with incremental and pragmatic policy-as-usual that is far from enough for altering the negative trends. The gap between negotiated global goals and needed measures according to scientific sustainable development scenarios is growing instead of being bridged. Since there is also a huge gap between policy and implementation, the distance between scientific findings and action on the ground is absolutely alarming. Advice from the scientific & technological community urgently deserves more serious attention in governance on all levels and translation into immediate action.

Barriers for collaboration between scientists and policymakers

Even if both sides are interested in collaboration, the different time frames in the scientific versus the political arena can make it difficult. The scientific process delivers findings and results on a rather long term basis, since there is a need to apply for funding, get it granted, start up the research project and conduct research, write about the results, and get articles peer-reviewed and published in academic journals. By contrast, policy-makers who are interested in scientific input often need the information on a rather short-term basis, within a few months or years, since that is usually the time available for drafting, implementing or evaluating a certain piece of legislation. Another barrier is the lack of incentives for scientists to be involved in policy work. Scientists are largely dependent on getting their work published in academic journals for advancing their careers and tenure. When research has been conducted for the purpose of policy advice, it is in most disciplines very difficult to get it published in academic journals, which can be a strong disincentive for scholars to actively engage in policy processes. For policy-makers it may be a burdensome process to take scientific knowledge into account, especially if the research results are in conflict with current policies or proposals. There is a fine line between providing policy relevant scientific recommendations and being policy prescriptive, and it is a challenge for scientists to suggest solutions while not compromising the scientific credibility and objectivity.

Social sciences sometimes forgotten

While Chapter 31 mentions that the scientific and technological community includes among others engineers, architects, industrial designers, urban planners and other professionals and policy makers,[42] some parts of academia feel excluded from the Major Group for the Scientific & Technological Community that is active in the CSD and UNEP. This applies to social sciences and humanities. For many years the scientific and technological community has focused on the physical and natural science underlying sustainability and turned to technical science for solutions. There is, however, a growing realization that a sustainable society will depend on the understanding of social and cultural practices and how human behavior may be modified.

Way Forward

Improve the science-policy interface with transdisciplinary collaboration

For closing the knowledge-policy-implementation circle in sustainable development governance, it is crucial to bring along and integrate multiple perspectives.[43] It is a priority that Rio+20 recognizes that the scientific community includes researchers from all disciplines, and emphasizes the central place that social science will play in bringing about sustainable development.[44] Disciplinary specialization and expert knowledge will continue to play an

[42] Agenda 21, Chapter 31, Paragraph 31.1.
[43] Brown, V, Harris, J & Russel, J (2010). *Tackling wicked problems through the transdisciplinary imagination.* Earthscan, Washington D.C.
[44] McKellar, B (2011, June). *Workshop Report.* Rio+20 regional workshop for Asia & the Pacific, 16-18 April 2011 in Kuala Lumpur. ICSU Regional Office for Asia and the Pacific. http://www.icsu.org/asia-pacific/events/events/rio-20

important role, but there is also a need to combine detailed expertise with holistic integration. A core challenge for the future is to distinguish when issues need to be handled by a disciplinary versus a transdisciplinary scientific approach. [45] Transdisciplinary research has the potential to democratize science, to produce social robust knowledge, identify problems early, allow contextualization, integrate different kinds of knowledge and aspects of sustainable development, and to speed up implementation.[46] It is useful for managing complexity through integrated assessments. In times of change when the roles of researchers and decision-makers draw closer together, transdisciplinarity is key for improving the science-policy interface.

Establish an Intergovernmental Panel for Sustainable Development (IPSD)

Access to the latest available science is a prerequisite for governments and international organizations for designing sound policies. Within the UN system, integration and sharing of information has been limited due to different data systems. International institutions involved with sustainable development need to coordinate their scientific methodologies and indicators and make them compatible. This could be achieved through the establishment of an Intergovernmental Panel on Sustainable Development, similar to IPCC and IPBES. The Panel would play a major role in promoting and monitoring progress towards sustainable development. [47] It would carry out a sustainable development research agenda and provide thorough policy advice based on scientific evidence. The Panel could be mandated to function as an umbrella organization for all UN bodies dealing with science and avoid their duplications of efforts. The IPSD would merge different science strands for fruitful synergies and would be the key interlocutor for policy-makers regarding sustainable development science.

Create momentum for implementation of the precautionary principle

Decision-making based on best available science urgently requires systematic research on planetary ecological boundaries. This assessment must then be used for reviewing the impact of emerging practices and technologies on the international level. Twenty years after the affirmation of the precautionary principle, it is due time to ensure that no new substances are allowed if there is a doubt regarding their potential of harming the environment and reducing the natural capital. In the case of practices and activities creating short-term risks for ecosystems and communities, a proper insurance mechanism should obligate those taking the risks fully repair the damages that any accident resulting from their actions might cause. Rio+20 presents a unique opportunity to develop institutional arrangements for the effective implementation of the precautionary principle.

Apply a two-track approach in science and policymaking

Scientific involvement is crucial for supporting the abilities to innovate, adapt, and learn. Quick incremental solutions need to be complemented by long-term fundamental changes in policy-making. In light of this, two approaches must be carried out in parallel and recognized as equally important: (A) Emergency solutions now, that begin to stop and reverse negative environmental trends and redress inequalities within the current inadequate institutional framework, and (B) Long term structural solutions that gradually change values, institutions and policy frameworks. This was suggested in the Stockholm Memorandum for Tipping the Scales Towards Sustainability, issued in May 2011 by scientists at the 3rd Nobel Laureate Symposium on Global

[45] Lenhard, J,Lucking, H & Schwechheimer, H (2006). *Expert knowledge, Mode-2 and scientific disciplines: two contrasting views.* Science and Public Poliicy, June 2006.
[46] Thompson Klein, J. et al, eds (2001). *Transdisciplinarity: Joint problem solving among science, technology, and society. An effective way for managing complexity*. Birkhäuser Verlag, Basel.
[47] McKellar, B (2011, June). *Workshop Report.* Rio+20 regional workshop for Asia & the Pacific, 16-18 April 2011 in Kuala Lumpur. ICSU Regional Office for Asia and the Pacific. http://www.icsu.org/asia-pacific/events/events/rio-20

Sustainability.[48] It would be useful to make the two-track approach explicit since the timeframes, methods and research designs are profoundly different for the separate tracks, and support must be available for both.

[48] http://globalsymposium2011.org/wp-content/uploads/2011/05/The-Stockholm-Memorandum.pdf

Chapter 32: Strengthening the Role of Farmers

Introduction

Farmers represent one third of the world's population and half of its poor. Chapter 32 of Agenda 21 includes not only farmers per se, but also other food producers, with a note in the chapter stating: *"In this chapter, all references to "farmers" include all rural people who derive their livelihood from activities such as farming, fishing and forest harvesting. The term "farming" also includes fishing and forest harvesting."* Chapter 32 is closely linked to Chapter 14 on promoting sustainable agriculture and rural development. The chapters on managing fragile ecosystems and a number of other chapters include references to farmers or rural food producers. The issue of farmer's rights was also addressed in Rio in the negotiations leading to the UN Convention on Biological Diversity (CBD).

Chapter 32 includes three activity areas: management-related activities, data and information, and international and regional cooperation.

The inclusion of Chapter 32 in Agenda 21 and the establishment of Farmers as one of the nine Major Groups can to a large extent be explained by the active involvement of international farmers' organizations in the UNCED process. Among the actors were the International Federation of Agricultural Producers (IFAP) and the International Federation of Organic Agriculture Movements (IFOAM). IFAP's history started when the Food and Agriculture Organization (FAO) and the rest of the UN system were created and farmers saw the need to form an international organization that could represent them. Some of the major national farmers' organizations joined together and founded IFAP in 1946.[1] In the 1970s interest for organic farming grew; an appeal in 1972 suggested a global organization for ensuring a future for organic agriculture, and IFOAM was formed. In 1992, IFOAM was an active proponent of the organic approach in Rio.[2][3]

20 years after UNCED, the world is facing a severe hunger crisis, with more than one billion people undernourished.[4] This is more hunger than ever before, despite the fact that enough food is produced for feeding every human currently on earth. All three dimensions of sustainable development (social, environmental and economic) are applicable to food production, and integrated frameworks to address the issue have been proposed (see Figure 1 below for details).However, the current policy debate around agriculture gives most attention to the economic dimension, with a growing recognition and concern for environmental threats. Outside sustainable development circles, the social dimension has often taken second seat, even though gender issues in agriculture and rural development have long been highlighted in international debates, and more recently the official discourse has emphasized the role of small-scale farmers. In light of this, strengthening the role of farmers and local food producers through Chapter 32 of Agenda 21 is remains highly relevant and a priority.

[1] http://www.ifap.org/about-ifap/history/en/
[2] http://www.ifoam.org/about_ifoam/inside_ifoam/history.html
[3] In 2010 IFAP ceased to exist due to bankruptcy. A movement started for rebuilding a global farmers' organization, and in 2011 the World Farmers' Organisation (WFO) was founded as an organization bringing together cooperatives and associations of agricultural producers from all agricultural sectors with members from both developed and developing countries.
[4] http://www.wfp.org/stories/number-world-hungry-tops-billion

Figure 1. Interconnectedness of agriculture's different roles and functions
Source: International Assessment of Agricultural Knowledge, Science and Technology for Development (2008). *Agriculture at a Crossroads. Global Summary for Decision Makers*, p. 12.

Implementation

International implementation

Paragraph 32.9 of Agenda 21 encouraged international institutions to support the involvement of farmers and their representatives in their deliberations. This has taken place to some extent, in different ways depending on the organizations involved.

Food and Agriculture Organization (FAO)

When it comes to participation of non-state actors in FAO's global governance, the agency applies a system that in some aspects resemble the Major Groups model. The formally recognized constituency groups in FAO are Women and Youth organizations; Non-governmental Organizations; Social/Peoples Movements; Labour Unions; Indigenous Peoples' Organizations; Charitable Organizations; Faith-based Organizations; and Professional Associations and Foundations. While farmers or food producers are not listed as their own group, many of the recognized constituencies include mainly farmers, fishers, herders, and forest users and their associations.[5] Since 1974, FAO has a Committee on World Food Security (CFS). CFS undertook a reform during 2009 in order to become more effective, partly through including a wider group of stakeholders.[6] In response to this, civil society built its own autonomous mechanism called the Civil Society Mechanism (CSM) for participation in the CFS. The coordination committee includes representatives of farmers, fisherfolks, pastoralists, landless, urban poor, agricultural workers, women, youth, indigenous, consumers, NGOs, and regional representatives for 14 different parts of the world.[7]

[5] http://www.fao.org/partnerships/cso-home/en/
[6] http://www.fao.org/cfs/cfs-home/cfs-about/en/
[7] http://cso4cfs.org/civil-society-mechanism/

International Fund for Agricultural Development (IFAD)
IFAD works with NGOs at the field level for better outreach to rural communities. A Farmers' Forum has been established for supporting farmers' organizations in development activities through an ongoing bottom-up process, with a tripartite process involving farmers' organizations, governments and IFAD.[8] A series of IFAD/NGO Consultations have taken place from 1990-2000.[9] IFAD has NGO focal points in its five regional divisions, a Technical Advisory Division, and an Office of Evaluation and Studies with designated NGO focal points.[10]

World Food Programme(WFP)
The WFP collaborated on a mainly operational level with almost 2,000 NGOs in 2010, divided into five broad categories: large international NGOs; smaller international NGOs; large national NGOs working in their country of origin; local NGOs; and community-based organizations such as local associations and local churches. Almost 90% of the NGOs involved belong to the last two categories.[11]

Box 1: WFP's Purchase for Progress initiative
Under the 5-year pilot initiative Purchase for Progress (P4P), WFP is working with farmers' organizations to offer opportunities for smallholder farmers, to access agricultural markets and thus to improve their lives. Trainings organized through P4P are tailored to the respective needs of the farmers in 21 pilot countries, 15 of which are in Africa, 4 in Latin America and 2 in Asia. Requests by farmers for additional trainings or support are considered in the design, implementation and evaluation of the whole project. Representatives from farmers' organizations take part in national Annual Reviews, where all stakeholders discuss experiences and set goals for the coming year. The national reviews form the basis for a P4P Global Review, in which farmer representatives are also present.

Source: WFP (2010), *WFP's operational relationship with NGOs, Annual Report 2010.*

Farmers involvement in World Bank and development bank programs
Paragraph 32.9 also mentions the World Bank and development bank programs as arenas where farmers should be involved. A recent example of a World Bank activity is an Open Forum on the Food Crisis that was held 14-15 April 2011. In the lead-up to the Forum, everyone interested could submit questions and ideas online on how to overcome the food crisis. More than 500 people from 88 countries took the opportunity to do so, including farmers. 58,000 people from 196 countries then participated in the Open Forum via a 24-hour online chat and a 2-hour live webcast.[12]

National and regional implementation

Comparative studies of high-resource versus low-resource farming
Farming practices vary a lot between different regions, as well as within regions and countries. Chapter 32 focuses on supporting low-resource farmers and suggests the need through paragraph 32.12b to conduct studies to compare the productivity and sustainability of high-resource versus low-resource agriculture. Such research has been conducted in various environmental and sociological settings, and there is growing evidence that sustainable agriculture practices have been able to increase productivity with minimum damage to the environment compared to conventional agriculture. [13] Although it may not be fully representative, a review of 286

[8] http://www.un-ngls.org/spip.php?page=article_s&id_article=807
[9] http://www.ifad.org/ngo/dialogue/history.htm
[10] http://www.ifad.org/ngo/contact/
[11] http://www.un-ngls.org/spip.php?page=article_s&id_article=817
[12] http://live.worldbank.org/open-forum-food-crisis
[13] UN-DESA, 2009, The contribution of sustainable agriculture and land management to sustainable development, Sustainable

sustainable agricultural projects carried out between 1999 and 2000 across eight categories of farming systems in 57 developing countries in Africa, Asia, and Latin America revealed that farmers increased yields by an average of 79% by adopting sustainable agricultural practices. In those projects, many practices were used but three types of technical improvements are argued to have played substantial roles in yield increases: 1) more efficient water use in both dryland and irrigated farming; 2) improvements in organic matter accumulation in soils and carbon sequestration; and 3) pest, weed, and disease control emphasizing on-farm biodiversity and reduced pesticides.[14]

Promoting sustainable farming technologies

Chapter 32 also aimed to promote and encourage sustainable farming practices and technologies and to reduce chemical use and waste in farming. There was recognition that location-specific environment-friendly farming techniques needed to be developed, in order to enhance crop yields while maintaining land quality, recycling nutrients, conserving water and energy, and controlling pests and weeds.

There is a growing body of literature documenting the extent of adoption of sustainable agriculture practices. The projects reviewed in the survey mentioned above made use of a variety of packages of resource-conserving technologies and practices, including: integrated nutrient management, conservation tillage, agro-forestry, water harvesting in dryland areas, livestock integration, and integrated pest management. As of 1999-2000, about 12.6 million farmers had adopted sustainable agricultural practices on 37 million hectares. This was equivalent to 3% of the 960 million hectares of arable and permanent crops in Africa, Asia and Latin America.

Although the general trend since 2000 have not been thoroughly documented, available figures for specific practices at the national level seem to point to an increase in areas cultivated under sustainable agriculture practices. For example in Brazil the minimum tillage system has spread from less than 1,000 hectares in 1973/74 to 22 million ha by 2003/04. In Argentina, there are more than 11 million hectares under zero-tillage, from less than 100,000 hectares in 1990. A study from 2005 reported 10% adoption rates of conservation tillage among smallholder farmers in Zambia. In Cambodia, the number of SRI (Sustainable Rice Intensification) users grew from 28 farmers in 2000 to at least 16,884 in 2004.

Quite separate from the issue of take-up of sustainable agriculture land management practices, some progress has been made on the use of chemicals in agriculture, for example on DDT use (through the Stockholm Convention) and on hazardous chemicals and pesticides (through the Rotterdam Convention). However, little progress has been made on waste in farming.

Organic agriculture, a specific type of sustainable agricultural practice, has received much attention since its recognition with Northern consumers in particular. The amount of organic agricultural land has grown in all world regions since UNCED, with a total of 37.2 million hectares in the end of 2009 (see Figure 2 below). This is 0.9% of all agricultural land in the world.[15] The increase has been strongest in Europe. However, in part due to an uneven playing field between organic agriculture and conventional practices, it is often not economically

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Development Innovation Briefs, 9, May.

[14] Pretty, J.N., Morison, J.I.L. and Hine, R.E. 2003, Reducing food poverty by increasing agricultural sustainability in developing countries. *Agriculture, Ecosystems and Environment* 95: 217-234. Pretty, J.N., Noble, A.D., Bossio, D., Dixon, J., Hine, R.E., Penning de Vries, F.W.T. & Morison, J.I.L. 2006, Resource-conserving agriculture increases yields in developing countries. *Environmental Science and Technology (Policy Analysis)*, 40 (4): 1114-1119.

[15] Willer, Helga and Kilcher, Lukas (Eds.) (2011). *The World of Organic Agriculture - Statistics and Emerging Trends 2011*. IFOAM, Bonn, and FiBL, Frick http://www.organic-world.net/yearbook-2011.html

beneficial to change to organic agriculture, which means the increase in organic surfaces would likely be faster if governments supported organic agriculture more.

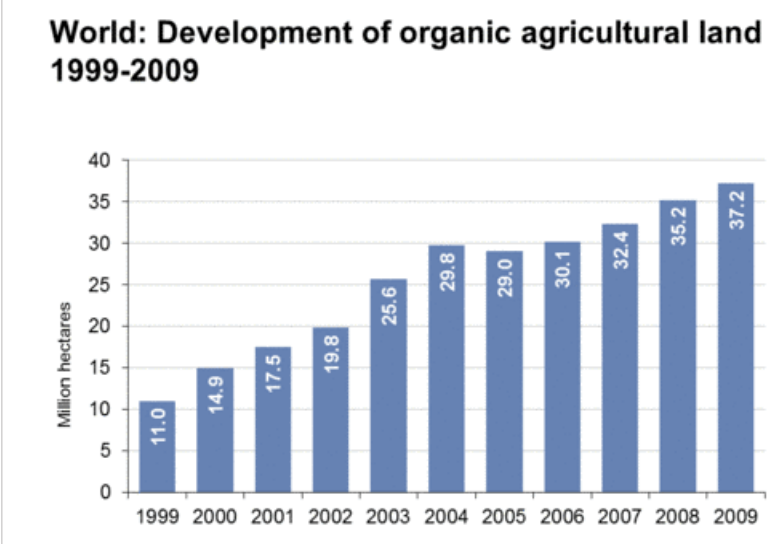


Figure 2: Increase in organic agricultural land worldwide 1999-2009
Source: FiBL, IFOAM and SOEL 2000-2011.

Ecological curricula for agricultural colleges
Paragraph 32.13 recognized the role of education in making agriculture more sustainable in the future through a new generation of agricultural scientists and field-level farmers and extension agents. While many farmers learn their profession by practice rather than by going to school, others attend institutional training before taking the step to become farmers or for improving their skills. Agricultural issues are also taught in colleges for agronomists, researchers, and other professionals. In some cases such courses have a sustainability profile, but it is still too common that ecology gets very little attention throughout the curricula in agricultural colleges.

Economic incentives and policy frameworks for sustainable agriculture
Chapter 32 asks governments to provide economic incentives for farmers to use natural resources more efficiently and sustainably, through pricing mechanisms that internalize environmental costs, trade policies, taxes, and other policy instruments. Globally, little progress has been registered on this front, with traditional, resource-intensive agriculture still benefiting from implicit and explicit subsidies that result in an unfair playing field for producers who do not embrace this type of agriculture (which is the case of most small-scale farmers in developing countries). Rural institutions in support of agriculture in a broad sense have also been identified as a weakness, especially in Africa. This encompasses credit systems, extension services and technical assistance, local production and distribution facilities for inputs, processing units, stocking facilities, and marketing and distribution systems.

Women in farming
One of the objectives of Chapter 32 is to support and enhance the legal capacity of women with regard to access, tenure and use of land; as well as improving women access to credit, technology, inputs and training. Whereas comparable data on these aspects seem to be lacking worldwide, these issues have obviously remained partially unaddressed, as proven by their mention in some form in all the UN reports on agriculture and food security since the Earth Summit. For example, in 2011 FAO states that "*priority areas for policy reform include*

empowerment of women farmers through enabling their participation in fair, flexible and efficient rural labour markets, and improving their access to agricultural resources and services".[16]

Food producers seeking involvement in policy processes
Decentralized decision-making through the creation and strengthening of local and village organizations is the first objective of Chapter 32. In local communities, countries, regions and on the international level, farmers have come together and formed associations for supporting each other in various ways, and particularly for having a common voice when seeking to influence legislation and acting on the policy level. In addition, there are many civil society organizations and NGOs whose membership is not composed by farmers, but who nevertheless care about food production, agricultural sustainability and/or farmers' rights. Some of them work with farmers as a target group and interact with them directly on the local level for realizing farmers' rights in practice.

An important role of farmers' associations is to facilitate the exchange of experiences with regard to farming that helps conserve land, water and forest resources, as well as minimizes the use of chemicals and reduces or reutilizes farm wastes. Paragraph 32.6e called on governments to support the formation of farmers' organizations by providing adequate legal and social conditions, which is happening in some parts of the world.

Challenges and Conflicts

Unsustainable high-resource agriculture and lack of incentives to change
Overall, the shift to sustainable agricultural and land management practices envisioned in agenda 21 has not happened. Sustainable agriculture remains marginal and has not succeeded in challenging the conventional model based on high levels of inputs and high environmental impacts. Recently, competition for land has increased due to land being used for biofuels. Subsidies to unsustainable farming have continued largely unabated, making it more difficult for those who would like to change course. For example, in 2011 it was reported that the amount of land being converted to organic cultivation across the UK had dropped by two-thirds since 2007, as falling sales of organic products mean fewer farmers are seeing a reason to change.[17]

Climate change
Climate change is a major challenge for the future of farming. Both mitigation and adaptation is needed since some farming practices are contributing to causing climate change, and at the same time agriculture is expected to be strongly impacted by global warming (see Figure 3 below for details). The exact impacts of climate change on agriculture will vary significantly between different regions.

Issues related to natural resource use and pollution
Other major issues facing the food production sectors are related to resource use and pollution (see chapters 14, 16, 17 and 18 of this report). Land degradation, water consumption, and the long-term availability of phosphorus as a needed input in regions and countries where its low natural concentration is a limiting factor for plant growth, have all been identified as concerns. Unlike fossil fuels, there is no alternative to phosphorus. Solutions for securing future crop

[16]FAO (2010-11)*.The state of food and agriculture.Women in agriculture – closing the gender gap for development.*http://www.fao.org/publications/sofa/en/
[17] The Guardian, 11 August 2011, Farmers turn away from organic as sales drop, accessed at http://www.guardian.co.uk/environment/2011/aug/11/fewer-farmers-turn-to-organic?INTCMP=ILCNETTXT3487

production must come from either reducing demand for phosphorus, a more efficient use and reuse, or less losses in the chain from mining to food products.

On the pollution side, the global use of nitrogen-based inputs and phosphorus has increased (see Figure 4 below), with a massive influx of phosphorus to the world oceans and other water bodies as a result, leading to growing environmental problems such as eutrophication of rivers and lakes.

Farmers group forgetting fishers and forest harvesters
While Agenda 21 states that the Farmers Major Group should include all rural people who derive their livelihoods from activities such as farming, fishing, and forest harvesting, a lot more focus has been directed towards farming agriculture than the other practices, both in reports such as this one and when the Major Group for Farmers engage in the CSD and other contexts, where most participants now are not aware of the wider intentional meaning. Had the Major Group been called 'food producers' this would have been more obvious and perhaps less of an issue.

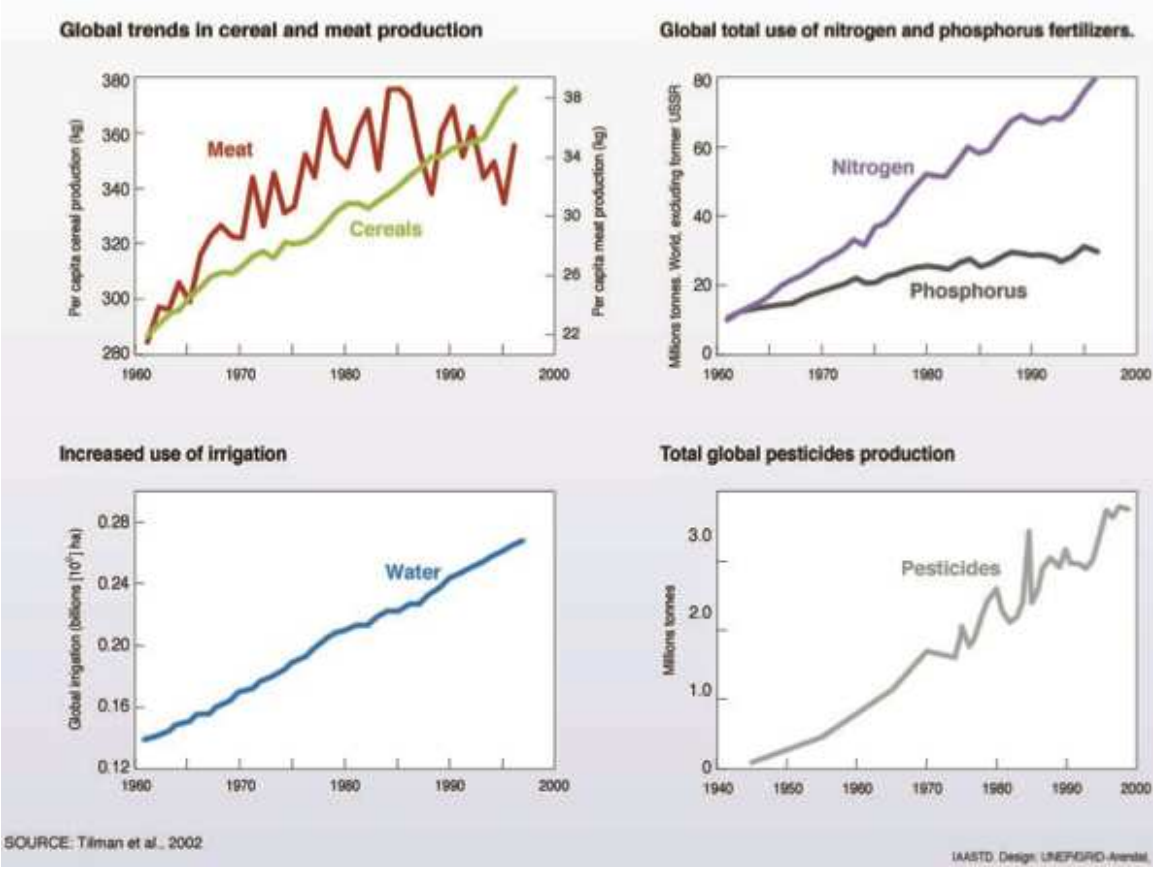


Figure 4: Trends in Agriculture
Source: IAASTD (2008), *Agriculture at a Crossroads. Global Summary for Decision Makers*, p. 12.

Way Forward

Enable food security for 9 billion people in 2050
In 2050, nine billion people are expected to live on Earth. There are many different, sometimes conflicting views of what the way forward for agriculture and farmers should be in order to ensure food security for all at that date. Latest among the various blueprints that have been

proposed, an international team of scientists has recently put forward a five-point plan for sustainable agriculture, which they claim would enable to feed all humans by 2050 and at the same time protect the planet, through:

- *Halt farmland expansion:* Huge environmental benefits can be achieved through incentives such as paying for ecosystem services, and thus reducing the clearing of land for agriculture.
- *Close yield gaps:* Food production could increase nearly 60% by making sure that all farmland currently in use lives up to its crop producing potential, something that could be achieved through better management and better use of crop varieties.
- *Use inputs strategically:* Nutrients, water and agricultural chemicals are currently rarely used in the right quantities. More intelligent input use would increase the yields and decrease environmental harm.
- *Shift diets:* Almost 50% more calories per person could be produced by dedicating croplands to growing food that is consumed by humans directly, rather than feeding livestock. Producing biofuels on top croplands is also draining human food supply.
- *Reduce food waste:* Another 50% increase in food availability can be achieved by stopping food from being eaten by pests, discarded or spoiled on the way from the farm to the mouth.[18]

Decentralization, empowerment and localized solutions

There is no standard solution for making every farm sustainable, but multiple local solutions are needed. All parts of the world need their own farming systems, adapted to the local context and agro-ecological conditions. Farmers need to be empowered to practice low-input agriculture and turn to alternative solutions. The relationship between large-scale and small-scale production needs to be re-thought in a broader, integrated sustainable development framework.

Increase farmers' participation in innovation

There is a need to look beyond the focus on the farm and industry to the wider agricultural innovation system, including market interactions as well as the wider institutional and policy environment. This requires putting farmers and food producers at the centre of innovation in order to shift the nature of these systems. This calls for a major rethinking of agricultural R&D, the boosting of the knowledge and capacities of farmers' organizations to innovate, the strengthening of networks and alliances to support, document and share lessons on farmer-led innovation, and the transformation of agricultural higher education.[19]

Increase farmers' resilience to climate change

More research is needed to prepare farmers for climate change, especially for providing knowledge about what changes can be expected in each local context. Farmers must receive such information combined with training on how to cope with climate change through adaptation responses. There is need for long-term scenarios, as well as early warning data that allows timely decision-making for the upcoming season based on weather and markets conditions. Needed measures may include changed cultivation timing, tillage practices, fertilization practices, introduction of new cultivars, crop protection, seasonal weather forecasting, crop insurance, water saving practices, and other changes as appropriate, and will need to happen on each farm through new management methods and technologies.[20] Some promising new research methods for valuing

[18]Foley, Ramankutty, Brauman, Cassidy, Gerber, Johnston, Mueller, O'Connell, Ray, West, Balzer, Bennett, Carpenter, Hill, Monfreda, Polasky, Rockstrom, Sheehan, Siebert, Tilman, Zaks (2011). *Solutions for a cultivated planet.* Nature. Doi: 10.1038/nature10452. http://www.stockholmresilience.org/research/researchnews/isfeedingninebillionpeoplepossible.5.668e42d4131b5c9d513800014998.html

[19]Scoones, I. & Thompson, J. (Eds.) Farmer First Revisited: Innovation for Agricultural Research and Development. London: Practical Action Publishing. March 2009.

[20]Olesen et al (2010). *Impacts and adaptation of European crop production systems to climate change*. European Journal of Agronomy

the long-term impacts on farming of climate change have been developed and should be used more. One such method is the Agro-Ecological Zone Model, in which current local conditions are used for calculating values of cropland and net revenue of crops, as a baseline for developing one harsh and one mild scenario to estimate the future climate change impacts.[21] Participatory research can help farmers understand adaptation options and the advantages of making adjustments. Researchers need to act as knowledge brokers by bringing decision-makers and practitioners together and identify a more comprehensive range of adaptation options than scientists alone are typically exploring. Rewarding early adopters is a way to increase resilience in agriculture through policy.[22]

However, a focus on climate change mitigation should not be forgotten. Both mitigation and adaptation is needed since some farming practices are contributing to causing climate change, and addressing the former will reduce the need for the latter.

2011. Issue 34, pp 96-112.

[21]Kurukulasuriya & Mendelsohn (2008).*How will climate change shift agro-ecological zones and impact African agriculture?* Policy Research Working Paper 4717. The World Bank Development Research Group, Sustainable Rural and Urban Development Team.

[22]Howden et al (2007). *Adapting agriculture to climate change*. PNAS, vol 104, no 50, December 11, 2007.

Section 4: Means of Implementation

Chapter 33: Financial Resource and Mechanisms

Introduction

Chapter 33 was written in recognition that without the sufficient resources, Agenda 21 could not be fully implemented. As funding was to come from individual country's public and private sectors, the primary problem in financing sustainable development (henceforth SD) was the resource disparity between nations. Presuming developed countries could and would provide the necessary funding to implement Agenda 21 within their own countries, Chapter 33 focuses on mobilizing resources for the least developed countries, as these countries cannot address environmental issues separate of poverty:

In the countries of the developing South, environmental protection objectives are inseparable from economic issues…Because the persistence of severe poverty guarantees the continuation of disease and squalor, policies for environmental protection alone are unable to improve either public health or more aesthetic assets such as natural beauty. Environmental protection in the South is slowed down by the flagging pace of economic development.[23]

Chapter 33's objectives can be summarized as follows: (1) to establish measures of financial resources and mechanisms for implementation, (2) to provide new and additional financial resources, and (3) to continue improving needed funding mechanisms to Agenda 21. Each chapter of Agenda 21 outlines the financial resources required to deliver its respective objectives, hence the way in which these resources were mobilized was a critical issue at UNCED. In fact, negotiations for this chapter were some or UNCED's most difficult.[24]

Implementation

The implementation cost of Agenda 21 in developing countries was estimated at $600 billion each year, of which $125 billion was to come from developed nations.[25] Of the $125 billion needed, only $67-68 billion was committed at the conference:

Concessionary funding from OECD countries	= $60 billion *(1992 figure)*
Additional bilateral estimates	= $6-7 billion *(actual amounts smaller)*
Global Environmental Facility	= $1.3 billion [26]

Many additional funding sources are included within Chapter 33. The table below evaluates the state of implementation of the primary commitments of Chapter as of 2010, according to some basic progress indicators.

Financial Mechanism	Commitment per Chapter 33	Progress Indicators	Implementation

[23] Hass, Levy, and Parson, *Appraising the Earth Summit: How should we judge UNCED's success?* http://www.ciesin.org/docs/008-570/008-570.html#fn6.
[24] The major issues being committed funding from (1) Official Development Assistance; (2) the International Development Association (IDA); and (3) the Global Environmental Facility (GEF). See *A Summary of Major Documents signed at the Earth Summit and the Global Forum*, by Parson, Hass, and Levy, http://www.ciesin.org/docs/003-312/003-312.html.
[25] Agenda 21, Chapter 33, Article 33.17.
[26] Hass, Levy, and Parson, *Appraising the Earth Summit: How should we judge UNCED's success?* http://www.ciesin.org/docs/008-570/008-570.html#fn6.

1. Official Development Assistance (ODA)	Reaffirmation of 0.7% ODA/GNP	OECD ODA levels	ODA decrease 1992 to 2000, now increasing
2. International Development Association (IDA)	Propose replenishment for 1992	IDA replenishment amounts	Funds increasing: more donor countries and higher donor amounts
3. Global Environmental Faculty (GEF)	Restructure to more transparent structure and Agenda 21 focus	GEF replenishment amounts	Funds increasing & managing funds for more international agreements
4. Bilateral Aid	Increase support	Bilateral donor commitments (seen in OECD Donor Country Aid Statistics)	Follows same trend as ODA, deceases till 2000, now increasing
5. Debt Relief	Support 1991 Paris Club agreement, create measures	Reductions in debt burden; debt relief initiatives	1991 passed, high relief for Iraq & Nigeria recently, currently dipping
6. Multilateral Development Banks	Increase support	Lending amounts from the World Bank, IMF and other regional banks	General lending increases (based on need), large recent increase in response to financial crisis
7. Foreign Direct Investment	Increase support	FDI levels	Increasing but volatile resource for individual countries
8. Innovative Financing *(i.e. incentives, tradable permits, military spending)*	Explore innovate financing options	Finance addressed through innovate sources	Innovative schemes further developed in recent conferences, especially in response to Global Financial Crisis

Source: UNDESA, Study on assessment of progress on Agenda 21 and Rio Principles, draft report, 2011.

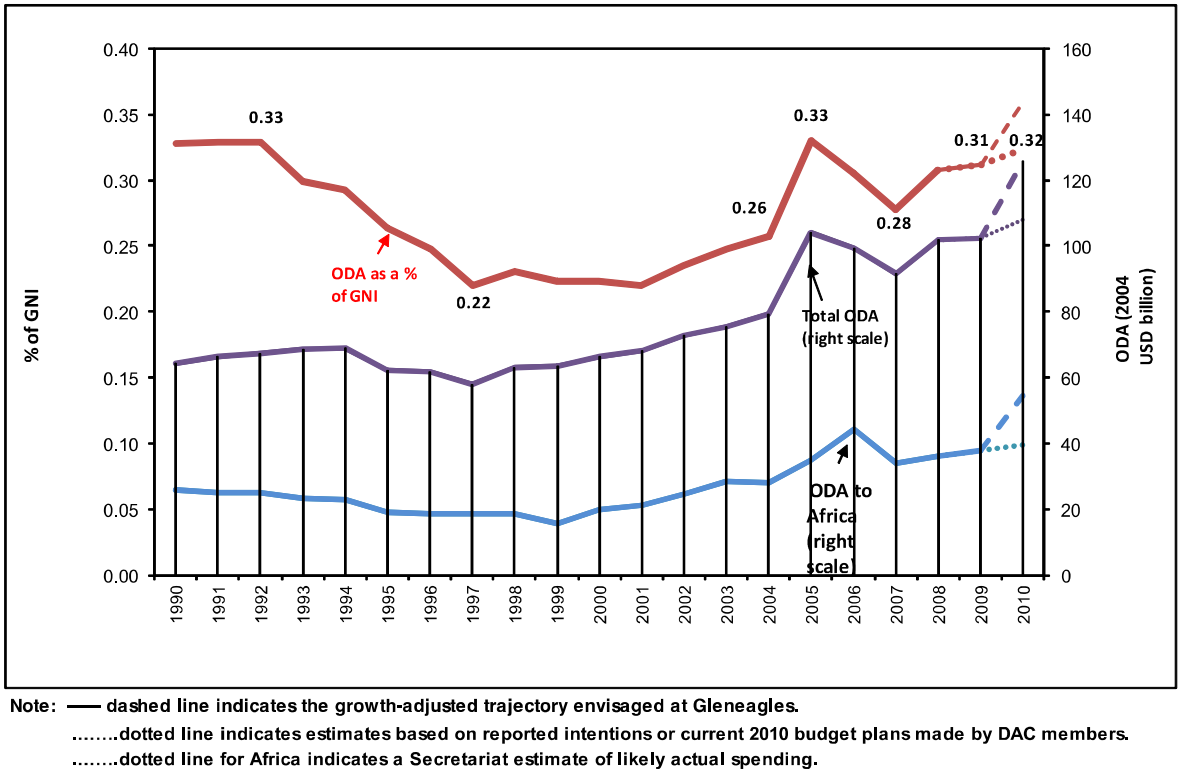
Official Development Assistance (ODA)

Chapter 33 reaffirmed of the UN ODA target of 0.7% GNP given annually per developed nation. Although ODA is not tied to any type of development programme specifically,[27] UNCED put a great deal of stock in ODA for its ability to create positive overspill into other financing sectors, such as increasing bilateral aid and debt relief, and encouraging private investment and international capacity building.[28]

From fairly constant ODA levels in 1992, ODA began a steady decrease after UNCED. Average ODA levels as a percentage of GNP fell from 0.35% in 1992 to 0.22% in 2000.[29] One reason frequently cited for this decrease is the increasing misgivings around aid effectiveness in the 1990s. Quoting studies that attested aid's ineffectiveness, sharp ODA cuts were made to some

[27] It can comprise debt relief, loans, non-concessionary funding, and support of multilateral institutions.
[28] Intergovernmental Decision, UN General Assembly, 1997.
[29] UN Economic and Social Council, Implementing Agenda 21, Report to Sec General, Feb 2002, Article 179.

nations, while modest cuts were made to nations whose policies were considered more conducive to aid effectiveness, or whose politics were more similar to donor countries.[30]



Note: —— dashed line indicates the growth-adjusted trajectory envisaged at Gleneagles.
.....dotted line indicates estimates based on reported intentions or current 2010 budget plans made by DAC members.
.....dotted line for Africa indicates a Secretariat estimate of likely actual spending.

Figure 1. DAC Members' net ODA 1990 – 2008 and projections for 2009-2010
Source: http://www.oecd.org/dataoecd/17/57/44982834.pdf

Although last year's ODA levels were the highest ever seen (in real terms) at $128.7 billion, net ODA only represented 0.32% of GNP,[31] less than half of the 0.7% target. In fact, in relative terms the 2010 ODA levels are equivalent to the 1990 levels. The OECD attributes recent ODA increases to the 2005 Gleneagles G8 Summit, where donor countries pledged to more than double ODA. But of the $48.7 billion pledged at Gleneagles, there has been a $19 billion dollar shortfall, only $1 billion of which can be attributed to lower GNP levels due to the Global Financial Crisis.[32] The United States continues to be the largest contributor of ODA[33], giving at record levels (in real terms) in 2010. However, the relative ODA analysis reveals that the US has made no increases in aid as percent of US GNP from 2009-2010. The top five recipients of gross ODA in 2010 were: Iraq, Afghanistan, Indonesia, China, and India, taking __ percent of gross ODA.[34]

International Development Association (IDA)

[30] UN Economic and Social Council, Implementing Agenda 21, Report to Sec General, Feb 2002, Article 180.
[31] OECD, *Development Aid Reaches an Historic High*, http://www.oecd.org/document/61/0,3746,en_2649_34447_47515235_1_1_1_1,00.html.
[32] UNDP, "*Official Development Assistance: The Status of Commitments, Projections for 2010, and Preliminary 2009 Figures*," Page 5, http://www.undp.org/developmentstudies/docs/oda_april_2010.pdf.
[33] The next largest donor (in real terms) is the United Kingdom, contributing less than half the ODA amount of the US. See http://webnet.oecd.org/oda2010/.
[34] OECD, *Total DAC Countries, Gross Bilateral ODA, 2008-09 average*, http://www.oecd.org/dataoecd/17/39/44285701.gif.

Between 1992 and 2002, IDA saw a comparatively small funding increase ($1 billion) with a $23 billion replenishment in 2002.[35] But since, both greater country participation and larger donor pledges have more than doubled IDA funding: $33 billion in 2005, $41.6 billion in 2007 (record donor pledges), and $49.3 billion in 2010, which focused on accelerating MDG progress. The IDA replenishment amounts are made up of donor contributions ($31.7 bn in 2010), World Bank transfers ($3.0 bn in 2010), and reflows from credit repayments ($14.6 bn in 2010).[36] IDA funding from credit repayments has grown along with IDA: "due to the historical growth of IDA over time, credit reflows have only started to become available in important volumes since about one decade ago."[37]

Global Environmental Facility (GEF)

UNCED restructured the GEF to give developing counties more power, making the voting process more transparent, extending GEF funded activities, and restricting new forms of conditionality to the GEF funding.[38] Today, GEF is not only a funding source for Agenda 21, but also serves as the financial mechanism for five other international environmental conferences: the Convention on Biological Diversity (CBD), the United Nations Framework Convention on Climate Change (UNFCCC), the Stockholm Convention on Persistent Organic Pollutants (POPs), the UN Convention to Combat Desertification (UNCCD), in addition the GEF supports implementation of the Montreal Protocol on Substances that Deplete the Ozone Layer (MP), although it is not formally linked to the protocol. Functioning as the funding channel for an increasing number of international environmental agreements, the GEF has also seen increasing replenishment commitments: $1 billion to pilot the GEF in 1991, $2.01 billion in 1994, $2.67 billion in 1998, $2.93 billion in 2002, $3.13 billion in 2006, and most recently in 2010, $4.25 billion.

During the 2010 negotiations the GEF made an increased commitment to aid efficiency, as Monique Barbut, the CEO to the GEF Secretariat, noted:

> *"It is now the GEF's responsibility to transform these resources into concrete results on the ground. We are committed to supporting policy reforms for a stronger GEF, with a focus on recipient country ownership, more efficient implementation, and greater responsiveness and accountability to the UN Conventions."*[39]

This push by the GEF is a delayed response to the targets of the Paris Declaration on Aid Effectiveness and the Accra Agenda for Action. The Paris Declaration involved over 100 signatories from donor and developing countries in the creation of robust targets and measurements to improve aid effectiveness. Adopted in 2005, the declaration includes five principles: ownership, alignment, harmonisation, results, and mutual accountability—all of which urge aid recipients to define their own national development plans. The Accra Agenda for Action emerged three years later to deepen the Paris agreement, focusing on stronger ownership, inclusive partnership and developing results, and capacity building.

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[35] World Bank Group Archives, *IDA: Historic Timeline, Five Decades of Development,* http://web.worldbank.org/WBSITE/EXTERNAL/EXTABOUTUS/IDA/0,,print:Y~isCURL:Y~contentMDK:22475865~pagePK:51236175~piPK:437394~theSitePK:73154,00.html.

[36] International Development Association, *IDA Replenishment,* http://go.worldbank.org/7ARHOU1WK0.

[37] IDA Resource Mobilization Department, *A Review of IDA's Long Term Financial Capacity & Financial Instruments,* Page 4, http://siteresources.worldbank.org/IDA/Resources/Seminar%20PDFs/73449-1271341193277/IDA16-Long_Term_Financing.pdf.

[38] Hass, Levy, and Parson, *Appraising the Earth Summit: How should we judge UNCED's success?* http://www.ciesin.org/docs/008-570/008-570.html#fn6.

[39] The GEF, *Record Funding for the Global Environmental Facility (Press Release),* http://www.thegef.org/gef/node/3010.

In the meantime, criticism of GEF governance and lack of responsiveness to developing country problems has mounted. Since its inception, the GEF's role and structure have been controversial. The concept of a single financial mechanism to serve more than one Multilateral Environmental Agreement (MEA) was promoted by industrialised "donor" countries whereas the developing countries favoured an approach that would have established separate MEA-specific financial mechanisms operating under the direct authority and control of each MEA Conferences of Parties (COPs). The GEF's consolidation of financial functions was seen by some as an effort to limit the amount of overall funding that might otherwise have been available to MEAs.[40] Many developing countries have expressed concern over the unclear guidance and high transaction costs attached to GEF funding mechanisms; funding from GEF also require burdensome reporting and co-financing criteria. Furthermore, as funding through GEF is allocated through implementing agencies such as the UNDP, the UNEP and the World Bank, it adds further bureaucracy to the process.[41] Although financing for sustainable development (SD) still remains a topic largely debated on, given the challenges and trends in financing and investment for SD it is very clear that insufficient progress has been made in this field. Negotiations have become even more difficult with the debate on 'common but differentiated responsibilities' in financing as well.[42]

Bilateral assistance

As it makes up a significant majority of ODA, bilateral assistance has grown with ODA. In 2005, with increasing debt relief from donor countries, bilateral assistance accounted for 76.9% of ODA.[43] In 2009, 70% of ODA came in the form of bilateral aid,[44] with the United States giving the highest percentage to its own bilateral development programs at 87% (17% of which went to Afghanistan and Iraq).[45] Only 3 countries gave less than 50% to bilateral programs in 2010: Italy, Austria, and Greece. [46] Considered exemplary bilateral assistance programs by subsequent UNCED documents[47] is the European Union's Everything but Arms (EBA) Regulation and the United States Africa Growth Opportunity Act, both of which open trade in an attempt to increase aid and investment spending in developing countries. Here we see the increasing emphasis on trade as aid policies in the 1990s.

Debt relief

Since 1956, the Paris Club, an informal intergovernmental group for negotiating debt relief, has cancelled over $60 billion in debt. However many countries have been unable to secure relief through the Paris Club, notwithstanding their frequent visits to the club's meetings, held behind closed doors with the club's 19 creditor nations. [48]

In addition to debt relief from the Paris Club, developing countries can look to the Multilateral Debt Relief Initiative (MDRI) and/or the Initiative for Heavily Indebted Poor Countries (HIPC), agreements compiled by the IMF, IDA/WB, African Development Fund, and G8. While these

[40] Consolidating global environmental governance: New lessons from the GEF? J. Werksman, 2003. Available at: http://www.yale.edu/gegdialogue/docs/dialogue/oct03/papers/Werksman%20GEF.pdf

[41] Supporting adaptation to climate change: What is the role for Official Development Assistance? Ayers & Huq, 2008. Available at: http://www.iied.org/climate-change/key-issues/evaluating-adaptation/supporting-adaptation-climate-change-what-role-for-official-development-assistan

[42] Financing for sustainable development in Latin America and the Carribean: From Monterry to Johannesburg. World summit on Sustainable Development, 2002. Available at: http://www.eclac.org/publicaciones/xml/0/10880/lcr2098i.pdf

[43] OECD, *Final ODA Data for 2005*, http://www.oecd.org/dataoecd/52/18/37790990.pdf.

[44] OECD, *Total DAC Countries, Gross Bilateral ODA, 2008-09 average*, http://www.oecd.org/dataoecd/17/39/44285701.gif.

[45] OECD, *United States, Gross Bilateral ODA, 2008-09 average*, http://www.oecd.org/dataoecd/42/30/44285539.gif.

[46] OECD, *Aid Statistics, Donor Aid Charts*, http://www.oecd.org/countrylist/0,3349,en_2649_34447_1783495_1_1_1_1,00.html.

[47] UN Economic and Social Council Implementing Agenda 21, Report to Secretary General

[48] Jubilee Debt Campaign, "Debt Institutions," http://www.jubileedebtcampaign.org.uk/Debt%20institutions+3498.twl.

initiatives have helped 32 countries, saving them between $340 million (Guyana) and $3.9 billion (Uganda),[49] many more countries do not meet the conditions set by these initiatives: debts which should be considered unpayable given a country's finances, or deemed illegitimate given how it was unfairly contracted.[50]

Multilateral Development Banks

Lending from the World Bank has steadily increased from $19.5 billion in 2002 to $24.7 billion in 2007, however, the Bank announced in June 2011 that its commitments for the financial year ending 30 June had fallen to $57.4 billion, from an all time peak of $72 billion in 2010.[51]. Under the auspices of the World Bank, funding from the International Bank for Reconstruction and Development (IBRD), the development bank for middle-income and creditworthy poorer countries, has followed suit, managing 50-60% of the World Bank's loans (SOURCE), with the remainder of World Bank funding going to the IDA.

In response to the Global Financial Crisis, the World Bank increased its lending by $20.6 billion in 2009 (totalling $58.8 billion).[52] Similarly, the IMF drastically increased its lending in 2008-2009 to $60 billion to emerging markets affected by the crisis. The IMF has not increased its lending steadily. In 2004 IMF loans dropped significantly as "benign" economic conditions worldwide decreased the demands for loans.[53] World Bank spending grows unlike the IMF because World Bank figures include the concessional funding of the IDA.

Regional and sub-regional development banks have had a role to play in SD financing as well, although small compared to players like the IMF and World Bank. From 1967 to 2010 the African Development Bank has granted $55.93 billion in loans and grants,[54] which is less than what the World Bank spent in 2009 alone. Lending by the African Development Bank has increased steadily, now contributing 6% of Africa's aid. Africa's 53 countries are all members of the Bank, although voting is determined by a nation's share in the Bank, a similar policy as the World Bank and IMF.

Foreign Direct Investment

Foreign Direct Investments, as defined by the World Bank, are the net inflows of investment to acquire a lasting management interest (10% or more of voting stock) in an enterprise operating in an economy other than that of the investor.[55] While foreign direct investment has tended to increase in recent history, there remains a high volatility of foreign portfolio investment and international bank loans,[56] creating a significant obstacle to reliable funding for the majority of developing countries.[57] The same 10 developing countries receive 80% of foreign direct

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[49] Jubilee Debt Campaign, "Multilateral Debt Relief Initiative," http://www.jubileedebtcampaign.org.uk/Multilateral%20Debt%20Relief%20Initiative+902.twl.

[50] Jubilee Debt Campaign, "*The Multilateral Debt Relief Initiative: the good, the bad, and the Ugly,*" June 2006.

[51] Bretton Woods Project, World Bank lending falls by 20 per cent (News), 11 Sept 2011, Update 77, http://www.brettonwoodsproject.org/art-568928

[52] Bretton Woods Project, *Record World Bank Lending (News)*, 10 July 2009, Update 66, http://www.brettonwoodsproject.org/art-564849.

[53] IMF, *Our Work: Lending by the IMF*, http://www.imf.org/external/about/lending.htm

[54] http://www.afdb.org/en/about-us/.

[55] International Monetary Fund, Balance of Payments database, supplemented by data from the United Nations Conference on Trade and Development and official national sources, *Foreign direct investment net inflows 2006-2010,* http://data.worldbank.org/indicator/BX.KLT.DINV.CD.WD.

[56] UN Economic and Social Council Implementing Agenda 21, Report to Secretary General.

[57] International Monetary Fund, Balance of Payments database, supplemented by data from the United Nations Conference on Trade and Development and official national sources, *Foreign direct investment net inflows 2006-2010,* http://data.worldbank.org/indicator/BX.KLT.DINV.CD.WD.

investment. [58] Overall net foreign direct investment worldwide has seen great extremes: valued at $0.2 trillion dollars in 1990, net inflows across the world increased 8 fold in 10 years to $1.61 trillion in 2000. The amount then dived to $0.64 trillion in 2003, then shot up to its highest level $2.35 trillion in 2007, and has dropped back down to $1.1 trillion in 2009. [59]

Innovative Financing

Since 1992 innovative financing for SD has received increasing importance and attention, especially in light of the global financial crisis, making previous finance mechanisms more challenging to replenish. Both the Clean Development Mechanism of the Kyoto Protocol, and the Secretary-General's High Level Advisory Group on Climate Change Financing have arisen as primer examples for their innovative international environmental financing mechanisms.

Seen as the first global environmental investment and credit scheme of its kind, the Kyoto Clean Development Mechanism encourages countries with low emissions commitments to implement emission-reduction projects in developing countries, allowing donor nations more flexibility in their emissions commitments, as they earn credits that counted towards Kyoto targets. Since the mechanism's beginning in 2006, it has registered more than 1,650 projects, and is anticipated to reduce CO2 emissions by 2.9 billion tons, equivalent to the Kyoto Protocol's first commitment period 2008-2012.[60]

To address the $100 billion agreed annually for climate actions in developing countries, the UN Framework Convention on Climate Change (UNFCCC) has explored the feasibility and potential several innovating financing measures such as: carbon taxes and emissions trading set by a credible carbon price ($30bn), regulate international aviation and shipping emissions ($10bn), low-carbon infrastructure investments by financial institutions ($40bn), and redirecting fossil fuel subsidies to only ($10bn).[61] Fossil fuel subsidies make it more difficult for non-fossil investments to be competitive and reduce the incentive to use energy efficiently.[62] Through these mechanisms the Secretary-General's High Level Advisory Group on Climate Change Financing believes the $100 billion needed will be challenging to raise, but feasible.[63]

Challenges and Conflicts

The main challenges and conflicts of SD financing are inadequate measurement and reporting; lack of collaboration; questions of aid effectiveness; trade and debt relief inequalities.

Measurement and reporting

While Chapter 33 included reference to financial resources and mechanisms vital to the implementation of Agenda 21, few mechanisms were expanded upon enough to be effectively implemented or monitored. Following UNCED the G77 expressed its disappointment in the final version of Chapter 33, many of the articles perceived as too vague to provide the necessary

[58] UN Economic and Social Council, Implementing Agenda 21, Report to Sec General, Feb 2002.
[59] International Monetary Fund, Balance of Payments database, supplemented by data from the United Nations Conference on Trade and Development and official national sources, *Foreign direct investment net inflows 2006-2010*, http://data.worldbank.org/indicator/BX.KLT.DINV.CD.WD.
[60] UNFCCC, *Kyoto Protocol, Mechanisms, Clean Development Mechanism*, http://unfccc.int/kyoto_protocol/mechanisms/clean_development_mechanism/items/2718.php.
[61] Department of Energy and Climate Change, *The Advisory Group on Long Term Finance Report Launch (News)*, http://www.decc.gov.uk/en/content/cms/tackling/international/icc_news/cms_news_pages/finance_group/finance_group.aspx.
[62] Work stream 7 paper: Public interventions to stimulate private investment in adaptation and mitigation, http://www.un.org/wcm/webdav/site/climatechange/shared/Documents/AGF_reports/Work_Stream_7%20_Public_Private.pdf
[63] Sectretary General's High Level Advisory Group on Climate Change Financing, Page 3.

financings to implement Agenda 21. In the absence of concrete targets, it has been difficult to evaluate progress other than in relation to the existing 0.7% ODA target. For instance, no innovative financing mechanisms were expanded specifically for the implementation of Agenda 21, although Chapter 33 listed several innovative sources that needed to be explored.[64]

Due to the absence of clear financial goals, measurement and reporting has not been under taken comprehensively. Chapter 33 and 38 did ask for donor countries to submit financial reports regarding their Agenda 21 activities by the 47th session of the UN General Assembly, but only a few nations submitted their reports on time, and a few more came in 6 months after the deadline.

Both the lack of clear targets and measurement procedures resulted in the inadequate provision of funds. Of the $125 billion per annum needed for SD in developing countries SD only the following measurable aid was available (technically) in 1992: ODA ($60 bn), GEF ($1 billion/ 3 years = $0.33 bn), IDA ($22 billion/ 3 years = $7.33 bn). Soon after the Rio conference, in 1994, UNCED recognized their insufficient funding sources could undermine the basis of the global partnership for sustainable development.[65] Although funding for SD has increased on the whole since 1992, the funding available, from multilateral and bilateral sources alike, still falls short. It is also important to note that while funding from sources like the IDA (part of the World Bank Group) and the Paris Club have provided substantial SD financing, nations in the global South have little to no influence within the structures of these organizations.[66]

Here it is important to note the volume of multilateral and bilateral funds spent on other international endeavours, relative to financing SD. Chapter 33 mentions the possible reallocation of military spending for Agenda 21 financing, as do many other agreements since, but no targets have been made for fathomable political reasons. If military defence budgets were reallocated, Agenda 21 could be implemented two times over.[67] Moreover, the total cost of bailing out the world's financial institutions from 2008 to 2009 was nearly ten times as much as the combined amount of international aid for the last 50 years.[68]

Collaboration

To continue the work completed of UNCED's first meeting, one of the conference aims was instilling a system for future collaborations—for developing countries to publish their priority needs, while developed countries committed to provide long term funding for their needs, the two stakeholders meeting through international round tables.[69]

Developing and developed countries have come together through a number of international conferences, continuing to deepen the work at UNCED, but have done so around more specific aims, compared to Agenda 21's broad objectives. Examples of successful North-South collaboration include: the UN Convention on Climate Change, the International Conference on Financing of Development, and the Paris and Accra meetings on aid efficiency. Agenda 21's challenge has been bringing countries in the global North and South together for overarching SD change, especially given the questions raised of aid effectiveness.

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[64] Chapter 33 lists (i) debt relief apart from the Paris Club, (ii) the use of economic and ficscal incentives and mechanisms, (iii) tradable permits, (iv) new fundraising schemes, and (v) the reallocation of resources from military spending, as innovative funding resources to be further explored.

[65] UNCED, 2nd session, 16-27 May 1994, article 59.

[66] World Bank voting is weighed according to the size of a nation's World Bank contributions.

[67] Annual military spending is over 1 trillion USD per year.

[68] End Poverty 2015 Millennium Campaign, "Inexplicable Bailouts; Explicable Poverty," June 2009, http://asiapacific.endpoverty2015.org/resources/latest-mdgs-news/millennium-campaign-calls-for-stronger-aid-accountability/.

[69] Chapter 33, Agenda 21, Article 9.

Aid effectiveness

Differing developing and developed country agendas are at the base of the discourse around aid efficiency, which although not addressed in Agenda 21, greatly effected the implementation of some of Chapter's most important activities. As accounts of ineffective development aid rose in number and popularity in the 1990s, ODA decreased. Furthermore, the GEF has been challenged organizationally with the G77 demanding greater decision making power, whereas donor countries insist on increasingly strict oversight mechanisms.

GEF has been challenged at the organizational core.[70] Resolving this dichotomy between open governance and tighter oversight remains a major challenge left unaddressed at UNCED. The Paris Declaration on Aid Effectiveness and the Accra Agenda for Action have tried to address this issue, involving both donor countries and aid recipients in the establishment of efficiency targets for all stakeholders. Progress towards the Paris and Accra agreements has been slow, due to obstacles such as: ambiguity in terms such as "ownership," the broad goals and limited time, and the voluntary nature of participation in evaluation (more developing nations were evaluated compared to donor countries).[71] However, amongst the implementation challenges, the agreements have proven to remain highly relevant for the improvement of development cooperation.[72]

Trade

Strong free trade markets are mentioned in Chapter 33 as essential to SD financing. The Everything by Arms (EBA) Regulation and the United States Africa Growth Opportunity Act, considered forms of bilateral aid, use trade as a development mechanism. While trade holds many possibilities for SD finance, it also poses challenges. If trade is liberalized without correct checks and balances, developing country markets can be undermined by donor country exports, without the opportunity to foster their own sustainable economies. Instead of citing trade as a support mechanism, future discussions must take into account the prevailing requirements for trade to create positive change. Further discussions around SD should acknowledge trade limits, as UNCED did in a report concerning the progress Agenda 21:

> *Furthermore, economic reform in developing countries and improved access to developed country markets do not, by themselves, ensure greater export revenues and increased participation in international trade. Development of export industries also requires an enabling framework, including transport infrastructure, efficient administrative procedures and structures, and trade-related financial services.*[73]

Lastly, initiatives to expand trade should recognize the increased costs to the environment via transportation. Air and water transport is a source of damaging emissions, hence the consideration of transport tax should continue through meetings such as the UNFCC.[74]

Debt relief

Debt relief programs have made billions of dollars available for developing countries to invest in their own sustainable development, but many countries are not eligible for relief. To illustrate, Indonesia's former dictator borrowed heavily, $30 billion of which came from the World Bank,

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[70] Hass, Levy, and Parson, *Appraising the Earth Summit: How should we judge UNCED's success?* http://www.ciesin.org/docs/008-570/008-570.html#fn6.
[71] Wood, B., *The Evaluation of the Paris Declaration, Phase 2, Final Report*, May 2011, Page ix.
[72] Wood, B., *The Evaluation of the Paris Declaration, Phase 2, Final Report*, May 2011, Page ix.
[73] UN Economic and Social Council, Implementing Agenda 21, Report to Sec General, Feb 2002.
[74] UNCED, 3rd Session, 11-28 April 1995, article 129.

and spent a larger portion of their funds on arms trade with the UK.[75] While these debts were incurred irresponsibly, Indonesia's debts are not considered illegitimate, and are therefore eligible for debt relief. Many argue the roots of debt troubles have been chronically ignored by debt relief programs, such as "unequal income and knowledge distribution, increasing domestic debt, high inflation…unsustainable patterns of export-oriented production,"[76] which were cited in the Global Forum's Debt Treaty back in 1992. More recently, loans to help developing countries cope with climate change are being offered by multilateral institutions like the World Bank, and individual countries like the UK, yet the foundations upon which debt issues have been built have gone unaddressed. In a letter to donor countries, 13 developing nations have said it is the industrialized countries that owe a 'climate debt' to poorer countries, which are most negatively affected by climate change.[77]

Way Forward

Future agreements concerning SD financing should be centred around measureable and time-bound targets, as one of the biggest challenges in implementing future targets has been and will be ensuring the finance committed is truly delivered to developing countries. Of the $31.8 million pledged to international environmental funds (i.e. the GEF, UN-REDD, MDG Achievement Fund for the Environment), only 41% is actually deposited into the respective fund. And once under control of the fund only 16% of the amount deposited is distributed to developing countries for environmental development projects.[78]

Just as measurable and time-bound targets are vital to SD financing, so is the implementation of an accountability system that monitors the delivery of financial commitments of individual countries. In the 20 years since the first Earth Summit, the international development field has come a long way in its measuring and reporting, even when it comes to financing, where impacts are hard to specify. The Paris Declaration on Aid Effective epitomizes the use of progress indicators: 56 commitments for both donor and grantee countries are measured using 12 indicators, each of which outlines the evidence-based approach to track progress, and a specific target to be met by 2010. Additionally, the measurements used to mark the progress of the Millennium Development Goals, which take a broad approach to development like Agenda 21, serves as a model to both utilize and build off of.

Because of the significant majority of ODA is controlled by individual nations through bilateral assistance, the transparency of measuring and reporting on SD finance delivery is of particular importance. Future measurements and reports should engage all stakeholders through peer review mechanisms, regional reviews, independent cross-country evaluations, and multilateral assessments. Just as developing and developing countries should collaborate on sustainable development targets, they should join efforts to hold one another accountable to the progress of their work. NGOs also have a role to play in the transparency of the accountability to finance commitments; consider the work of climatefundsupdate.org, an independent website that provides accessible statistics on the accountability of a growing number of international climate finance initiatives.

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[75] Jubilee Debt Campaign, *The Debt Crisis, Country Information, Indonesia,* April 2007, http://www.jubileedebtcampaign.org.uk/Indonesia+2792.twl

[76] Global Forum Alternative Treaties, "Debt Treaty: concerns and pledge of development and environment social movements and non-government organizations," http://www.earthsummit2002.org/toolkits/women/ngo-doku/ngo-conf/ngoearth17-2.html.

[77] Jubilee Debt Campaign, *News*, "*Developing country groups slam UK climate loans*, 27 June 2011, http://www.jubileedebtcampaign.org.uk/Developing%20country%20groups%20slam%20UK%20climate%20loans+7076.twl.

[78] Climate Funds Update, *Pledge v Deposited v Approved v Disbursed*, http://www.climatefundsupdate.org/graphs-statistics/pledged-deposited-disbursed.

As bilateral aid is held increasingly accountable, so should "trade for SD" and debt relief programs. Measureable targets and transparent reporting need to encompass responsible trade practices, which was left out of Chapter 33. The Fourth WTO Ministerial Conference (Doha, Qatar, November 2001) is of great importance, and should be pushed further in future documents. The Doha negations aim to reduce or eliminate tariffs, especially on products of export interest to developing countries. The conference also urged improved market access to agricultural, and the phasing out of export subsidies, with the reduction of trade-distorting domestic support a key priority.[79]

In regards to debt relief, in addition to recognizing and addressing the sources of the developing country debt crises, initiatives need be expand their conditions to include more countries in relief schemes. Debt relief programs could include innovative mechanisms such as debt-for-nature and debt-for-social development swaps.[80] With few methods available to hold creditor nations accountable to their debt relief strategies for developing nations, NGO movements to mobilize the public and political support, such as the Jubilee Debt and Make Poverty History campaigns, are of upmost importance in moving SD financing forward.

[79] UN Economic and Social Council, Implementing Agenda 21 Report to Secretary General, February 2002, Article 194.
[80] UNCED, 3rd Session, 11-28 April 1995, article 118.

Chapter 34: Transfer of Environmentally Sound Technology, Cooperation and Capacity-Building

Introduction

Facilitating access to environmentally sound technologies (ESTs) is recognised as central to a great many of the sustainable development objectives outlined in Agenda 21, especially for developing countries whose technological resources are likely to be limited. For this reason, Chapter 34 of Agenda 21 proposed objectives linked to (a) the dissemination of scientific and technological information; (b) the promotion of technology transfer; (c) the promotion of environmentally sound indigenous technologies; (d) support for endogenous capacity building around technology use; and (e) the promotion of technological partnerships between holders and users of ESTs.[1] Technology transfer has taken on particular significance in relation to climate change, and has been defined by the International Panel on Climate Change (IPCC) as 'a broad set of processes covering the flows of know-how, experience and equipment […] amongst different stakeholders such as governments, private sector entities, financial institutions, non-governmental organizations (NGOs) and research/education institutions'.[2] Technology transfer represents a significant mechanism through which to accelerate technological change, but successful implementation is likely to be contingent upon the effectiveness of the associated institutional framework.

Implementation

Development of international information networks which link national, subregional, regional and international systems

Agenda 21 acknowledged that successful technology transfer is contingent upon the capacity of policymakers, particularly in developing countries, to make informed choices, and outlined the need for international information networks capable of matching information to national priorities.[3] In 2010, a Report published by the United Nations Framework Convention on Climate Change (UNFCCC) into the contribution of the Kyoto Protocol's Clean Development Mechanism (CDM) to technology transfer found that 'countries and project types that face an information barrier have a lower rate of technology transfer for CDM projects'.[4] Specifically, the information barriers identified in technology needs assessments (TNAs) carried out by CDM host countries are, in rank order: 'a lack of information on energy efficiency and ecological safety of technology equipment, a lack of information about governmental structures, difficulties in obtaining information on organizations and companies that deal with energy efficient and modern climate change mitigation technologies, lack of information among investors on the potential technology market and lack of information about financing.'[5]

At the seventh session of the Conference of the Parties (COP) in 2001, Parties to the UNFCCC agreed upon a technology transfer framework, while the Expert Group on Technology Transfer (EGTT) was established with the intention of facilitating the framework's implementation.[6] A

[1] http://www.un.org/esa/dsd/agenda21/res_agenda21_34.shtml
[2] IPCC (2000), *Methodological and Technological Issues in Technology Transfer*, 'Summary for Policymakers', p. 3, http://www.ipcc.ch/pdf/special-reports/spm/srtt-en.pdf
[3] http://www.un.org/esa/dsd/agenda21/res_agenda21_34.shtml
[4] UNFCCC (2010), *The Contribution of the Clean Development Mechanism under the Kyoto Protocol to Technology Transfer*, p. 22, http://cdm.unfccc.int/Reference/Reports/TTreport/TTrep10.pdf
[5] Ibid.
[6] UNFCCC (2010), *Role And Work Of The Expert Group On Technology Transfer*,

significant part of the framework was its technology information component, which 'defines the means, including hardware, software and networking, to facilitate the flow of information between the different stakeholders to enhance the development and transfer of technologies'.[7] The pilot project of the technology information component was the development of a web-based technology information clearing house (TT:CLEAR), which in 2001 was opened up to 600 users as part of a testing period.[8] Following a survey on its effectiveness, the system was opened up to public access in 2003, and currently enables users to find information on technology transfer projects and programmes, case studies of successful technology transfer, ESTs and know-how, organisations and experts, methods, models and tools to assess mitigation and adaptation options and strategies, relevant web sites, and ongoing work of the Parties and EGTT on technology transfer.[9]

Subsequently, a pilot network was established linking TT:CLEAR to national and regional technology centres including the UNEP Sustainable Alternatives Network (SANet), the Clean Energy Portal (CEP), Canada, the Climate Technology Cooperation Gateway of the United States of America (US-CTC Gateway), the International Technology Trade Centre (ITTC) of Tsinghua University, China, and the Tunis International Centre for Environmental Technologies (CITET).[10] An evaluation published in 2007 highlighted several issues around the effectiveness of the pilot project, including the importance of common standards and definitions to the harmonisation of information within a network, the need for long-term commitment on the part of participating technology centres, including sufficient human resources, and the need for close cooperation between nodes.[11] While the technical feasibility of the project was confirmed, there are question marks over how the network can be extended to incorporate further technology centres.[12]

Support of and promotion of access to transfer of technology

The CDM, referred to above, is designed to help countries with emission-reduction commitments under the Kyoto Protocol to earn saleable certified emission reduction (CER) credits by implementing emission-reduction projects in developing countries.[13] As most greenhouse gas mitigation technologies are designed and produced in developed countries, the CDM assumes significance as a potential driver of technology transfer.[14] Annual investment in registered CDM projects rose from USD 40 million in 2004 to USD 47 billion in 2010, and totalled over USD 140 billion to mid 2011.[15] Of the 3,276 projects registered by 2011, 33% were found to have involved technology transfer, interpreted as 'the use of equipment and/or knowledge not previously available in the host country by the CDM project', although in a further 21% of cases it was unclear whether technology transfer had taken place.[16] The highest rates of technology transfer were for industrial gases and methane avoidance, and the lowest for biomass energy and renewable energy.[17]

The host countries with the most CDM projects were China (1,468), India (694) and Brazil (195), but a relatively low proportion of projects in these countries were found to involve technology

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http://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/egtt_en_070523.pdf
[7] Ibid.
[8] http://unfccc.int/ttclear/jsp/Information.jsp
[9] Ibid.
[10] Ibid.
[11] UNFCCC (2007), *Report on the pilot project on networking between the UNFCCC technology information clearing house (TT:CLEAR) and regional and national technology information centres*, p. 10, http://unfccc.int/resource/docs/2007/sbsta/eng/inf01.pdf
[12] Ibid. p. 13
[13] http://unfccc.int/kyoto_protocol/mechanisms/clean_development_mechanism/items/2718.php
[14] UNFCCC (2011), Benefits of the Clean Development Mechanism 2011, p. 21, http://cdm.unfccc.int/about/dev_ben/pg1.pdf
[15] Ibid, p. 6
[16] Ibid. p. 24
[17] Ibid. p. 22.

transfer (20%, 16% and 35% respectively).[18] The proportion of projects involving technology transfer was highest in Mexico, Thailand and Vietnam, at 91%, 83% and 74% respectively.[19] The rate of technology transfer for China, India and Brazil has reduced substantially over time, so that overall technology transfer has also decreased.[20] The decline in overall technology transfer might be interpreted as a sign of the CDM's success insofar as a saturation point will be reached as more and more projects are completed, although it remains the case that the majority of developing countries involved in the CDM are still in need of 'substantial levels' of technology transfer.[21] The increased likelihood of technology transfer taking place through alternative mechanisms might also be viewed as a contributing factor.[22]

A study of the international transfer of wind technology from 1988 to 2007 found that while the CDM has played a role influencing the degree of technology transfer between developed and developing countries, its effects have been relatively small when compared with other factors such as 'domestic absorptive capacity', or the ability of host countries to integrate ESTs into the local economic and institutional context.[23] In other words, interventions directed at improving the capacity of host countries to *absorb* ESTs are likely to be more effective than measures that simply facilitate access to technologies. Connectively, a recent empirical study of 1000 CDM projects across 49 host countries and 23 project categories has claimed that 'the contribution of the CDM to technology transfer can at best be regarded as minimal'.[24] Only 265 of the projects in the sample involved technology transfer, and in the vast majority of cases 'technological learning and capability building [were] restricted only to the level of operation and maintenance of an imported technology'.[25] Given that the objective of the donor country is to generate CER credits as effectively as possible, ensuring that technology transfer encompass institutional learning and capacity building is unlikely to be a priority, reducing the long-term effectiveness of CDM projects.[26] Moreover, the capacity of host countries to define and enforce the criteria against which the success of a project should be measured is likely to be limited.[27]

Improvement of the capacity to develop and manage environmentally sound technologies

The influence of 'domestic absorptive capacity' upon technology transfer is explicitly recognised by the work of the Global Environment Facility (GEF), which in 1994 was reconstituted as the financial mechanism for the UNFCCC and UN Convention on Biological Diversity.[28] The GEF has evolved into the largest public sector funding source for ESTs,[29] and from 1994 to 1998 aimed to finance 'enabling mitigation and adaptation activities in eligible recipient countries' through both short-term and long-term programmes.[30] GEF operational programmes from 1998 to 2007 emphasised the transfer of mature energy efficiency and renewable energy technologies that 'faced human, institutional, technological, policy, or financial barriers' in host countries.[31] In

[18] Ibid.
[19] Ibid. p. 24
[20] Ibid. p. 25
[21] Ibid.
[22] Ibid.
[23] Haščič, I., Johnstone, N., *The Clean Development Mechanism and international technology transfer: empirical evidence on wind power using patent data*, Paris: Organisation for Economic Co-operation and Development (OECD), p. 14, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1493241
[24] Das, K. (2011), *Technology transfer under the Clean Development Mechanism: an empirical study of 1000 CDM projects.* Working Paper 014, The Governance of Clean Development Working Paper Series. School of International Development, University of East Anglia, United Kingdom, pp. 7, 2, http://www.uea.ac.uk/dev/gcd/Das+2011
[25] Ibid. p. 28
[26] Ibid.
[27] Ibid. p. 29
[28] http://www.thegef.org/gef/whatisgef
[29] GEF (2010), *Transfer of Environmentally Sound Technologies: Case Studies from GEF Climate Change Portfolio*, p. 1, http://www.thegef.org/gef/sites/thegef.org/files/publication/Tech-transfer_2010.pdf
[30] Ibid. pp. 2-3.
[31] Ibid. p. 3

2004, the GEF's operational strategy for removing barriers to the uptake of ESTs in developing countries was officially codified, and encompassed themes such as policy frameworks, awareness and information, business and delivery models and availability of financing.[32] Subsequently, and in response to the 13th COP to the UNFCCC, GEF developed the Poznan Strategic Program on Technology Transfer, which emphasised the significance of efficient technology markets, partnerships and cooperation and comprehensive capacity building across all institutional levels.[33] GEF's funding pledge for its climate mitigation programme from 2010-14 has reached approximately $1.4 billion, and its work over this period aims to promote innovative technologies at an early stage of commercialisation, maintain the focus on the elimination of barriers to successful EST deployment and support capacity building.[34]

The Technology Mechanism established at the 16th Conference of the Parties (COP) in 2010 represents a move towards more concerted action on technology transfer on the part of the UNFCCC.[35] The Mechanism includes a Technology Executive Committee (TEC) intended to promote public and private investment in ESTs and their transfer, and a Climate Technology Centre and Network (CTCN) to 'facilitate national, regional, sectoral and international technology networks, organizations and initiatives' and work to strengthen host country capacity.[36] Central to the Technology Mechanism is the idea that successful technology transfer rests upon the creation of 'enabling environments' and the elimination of barriers.[37] The Technology Mechanism is expected to be fully operational in 2012.[38]

Establishment of a collaborative network of research centres

The CTCN represents a nascent attempt to establish an international network of research centres dedicated to technology transfer composed of existing national, regional and international technology centres and institutes.[39] Meanwhile, the Small Developing Island Renewable Energy Knowledge and Technology Transfer Network (DIREKT), a cooperation scheme involving universities from Germany, Fiji, Mauritius, Barbados and Trinidad & Tobago funded by the EU, aims to 'strengthen the internal science and technology capacity in the field of renewable energy' of a sample of ACP (Africa, Caribbean, Pacific) small island developing states, foster scientific and technological cooperation between the participating countries and the EU, and promote the transfer of research results through the creation of 'technology transfer centers' in participating countries.[40] To date, DIREKT has led to the establishment of transfer centres in Barbados, Fiji, Hamburg, Mauritius and Trinidad & Tobago.[41]

The EU is also involved in the Joint European-Latin American Universities Renewable Energy Project, which involves universities from Germany, Latvia, Bolivia, Brazil, Chile and Guatemala and aims to promote capacity building for renewable energies at the university level.[42] Significantly, one of the programme's specific objectives is to 'develop and implement labour market-oriented research and educational approaches in the field of renewable energies', an approach which clearly recognises the human capital dimension of a host country's absorptive capacity.

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[32] Ibid. p. 4
[33] Ibid. p. 5
[34] Ibid. p. 6
[35] http://unfccc.int/ttclear/jsp/TechnologyMechanism.jsp
[36] Ibid.
[37] UNFCCC (2010), *Preparing for the implementation of the proposed Technology Mechanism: A working paper of the Expert Group on Technology Transfer*, p. 15, http://unfccc.int/ttclear/jsp/EGTTDoc/EGTT_Modalities_draft_working_paper_4%20November.pdf
[38] http://unfccc.int/ttclear/jsp/TechnologyMechanism.jsp
[39] Ibid.
[40] http://www.direkt-project.eu/objectives.html
[41] http://www.direkt-project.eu/transfer-centres.html
[42] http://jelare-project.eu/objectives-outputs.html

Support for programmes of cooperation and assistance

Technology assessment in support of the management of environmentally sound technology

ESTs need to be compatible with host countries' sustainable development objectives, making it impossible to prescribe an all-purpose recipe for technology transfer appropriate to all national contexts. For this reason, technology assessments are vital in allowing host countries to both accurately identify where technological capacity is lacking and determine which technologies are most appropriate in terms of their environmental, economic and technical performance.[43] One way of illustrating the problem is to highlight the diversity of ESTs available to development actors. Examples of EST types include abatement technologies, which 'abate the discharge of pollutants and/or wastes at the end of the production (or consumption) process', prevention technologies which minimise the generation of pollutants in the first place, and substitution technologies, which 'substitute renewable inputs to production and consumption for non renewable inputs, as energy source, as alternative process auxiliary or as product input'.[44] ESTs might fulfil a number of functions, rendering the question of determining which technologies are most appropriate even more complex; in general, it will be necessary to strike a balance between multiple technology types.[45] Technology needs assessments are crucial to enabling informed choice and ensuring the long-term effectiveness of technology transfer.

Technology needs assessments (TNAs) are key to the work of the UNFCCC on technology transfer, allowing for a host-country driven approach which brings 'together stakeholders to identify needs, methodologies, and areas and sectors to be covered and to develop plans to meet those needs'.[46] Specifically, the UNFCCC defines TNAs as 'a set of country-driven activities that identify and determine the mitigation and adaptation technology priorities of Parties other than developed country Parties [which] involve different stakeholders in a consultative process, and identify the barriers to technology transfer and measures to address these barriers through sectoral analyses'.[47] The TNA Handbook, developed by the United Nations Development Programme and first published in 2004, provides a systematic approach for conducting TNAs, and emphasises the importance of selecting technologies in line with national sustainable development priorities.[48] As of June 2008, the GEF had provided financial support to 92 non-Annex I Parties to conduct TNAs, of which 78 were supported by the United Nations Development Programme (UNDP) and 14 by the United Nations Environment Programme (UNEP).[49]

A study of 70 TNAs found that an assessment process similar to that set out in the TNA Handbook was followed in the majority of cases.[50] In most cases, stakeholders were involved, and in some cases stakeholders were involved in stage of the assessment.[51] All TNAs were found to include 'a detailed overview of the process for selecting key sectors' for greenhouse gas emission-reductions, while reports commonly included 'an initial review of options; identification of capacity-building needs; identification of barriers; setting of criteria; identification of next

[43] ESCAP (2008), *Regional Study to Guide Policy Interventions for Enhancing the Development and Transfer of Publicly-Funded Environmentally Sound Technologies in Asia and the Pacific Region*, p. 6, http://www.greengrowth.org/download/2009/Regional%20Study%20to%20Guide%20Policy%20Interventions%20for%20Enhancing%20the%20Development%20and%20Transfer%20of%20Publicly-Funded%20Environmentally.pdf
[44] Ibid.
[45] Ibid. p. 8
[46] UNFCCC (2009), *Second synthesis report on technology needs identified by Parties not included in Annex I to the Convention*, p. 6, http://unfccc.int/resource/docs/2009/sbsta/eng/inf01.pdf
[47] UNFCCC (2010), *Handbook for Conducting Technology Needs Assessment for Climate Change*, p. ix, http://unfccc.int/ttclear/pdf/TNA%20HANDBOOK%20EN%2020101115.pdf
[48] Ibid. p. 5
[49] UNFCCC (2009), *Second synthesis report on technology needs identified by Parties not included in Annex I to the Convention*, p. 7, http://unfccc.int/resource/docs/2009/sbsta/eng/inf01.pdf
[50] Ibid. p. 10
[51] Ibid.

steps; and identification of measures to address barriers'.[52] Particularly comprehensive TNAs were produced by Burundi, China, Croatia, Dominica, Ghana, Malawi, Namibia, United Republic of Tanzania and Viet Nam; project proposals were included in 24 instances.[53]

Collaborative arrangements and partnerships

Technology transfer can be compelled across a range of pathways, including government-driven pathways, private sector-driven pathways and community-driven pathways, the last of which involving 'community organisations with a high degree of collective decision making'.[54] Even where technology transfer is largely government-driven, cooperation is essential to creating enabling environments and ensuring the benefits of technology sharing are sustainable in the long-term.

A significant outcome of the World Summit on Sustainable Development (WSSD) in 2002 was the establishment of a framework for voluntary, multi-stakeholder partnerships for sustainable development.[55] The partnerships were not intended as a substitute for Government commitments to sustainable development, but as a significant means of strengthening implementation by facilitating cooperation among stakeholders.[56] Data on the 338 partnerships registered by February 2008 indicated that a significant majority (83%) had Government involvement, while other Major Groups involved included non-governmental organisations (30%), business and industry (38%), the scientific and technological community (18%), and local authorities (9%).[57] 49% of registered partnerships were found to involve 'some form of direct technology transfer', described as either targeted technical assistance, help with technology procurement and the transfer of technology and know-how 'from private sector partners in developed countries to their counterparts in developing countries and countries with economies in transition'.[58]

Therefore, while technology transfer cannot be considered the primary objective of sustainable development partnerships it represents a significant mechanism through which to implement partnership objectives. Moreover, further partnerships emphasising human resource development and the strengthening of institutional capacity can be seen to play a role in creating the enabling environments upon which technology transfer depends for its success.[59] Lessons to emerge from the use of partnerships since the WSSD include the importance of engaging local actors, the role partnerships can play in enhancing national sustainable development strategies, and the importance of partnership for corporate social responsibility efforts.[60]

The EU Energy Initiative for Poverty Eradication and Sustainable Development (EUEI), launched by the EU at the WSSD, aims to promote the role of energy in poverty alleviation by facilitating cooperation between developing countries and other partners.[61] Amongst other objectives EUEI aims to attract resources, including technology, from the private sector, financial institutions, civil society and end-users.[62] Crucially, activities implemented under the Initiatives are demand-led

[52] Ibid. p. 11
[53] Ibid.
[54] ESCAP (2008), *Regional Study to Guide Policy Interventions for Enhancing the Development and Transfer of Publicly-Funded Environmentally Sound Technologies in Asia and the Pacific Region*, p. 15, http://www.greengrowth.org/download/2009/Regional%20Study%20to%20Guide%20Policy%20Interventions%20for%20Enhancing%20the%20Development%20and%20Transfer%20of%20Publicly-Funded%20Environmentally.pdf
[55] UN (2008), Secretary General's Report on Partnerships, p. 3, http://www.un.org/esa/dsd/resources/res_publsdt_par.shtml
[56] Ibid. p. 3
[57] Ibid. p. 10
[58] Ibid. p. 13
[59] Ibid.
[60] Ibid. p. 26
[61] http://www.euei.net/about-euei
[62] Ibid.

and 'driven by the needs and priorities of the participating developing countries'.[63] By engaging communities and adhering to principles of cooperation and ownership the EUEI seeks to create an appropriate and enabling environment for the transfer and use of ESTs.[64]

The Asian and Pacific Centre for Transfer of Technology (APCTT), a regional institution of the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), was established to facilitate technology transfer in the Asia-Pacific region, with a focus on small and medium enterprises (SMEs).[65] APCTT works to facilitate more than 250 technology transfer negotiations among SMEs every month, and has more than 1,000 partners in 70 countries.[66]

Challenges and Conflicts

The overall decline in the transfer of ESTs over the lifetime of the CDM, referred to above, indicates that efforts to facilitate technology transfer have had only limited success, and that attempts to improve the absorptive capacity of host countries through a process of institutional change have not gone far enough. Indeed, the apparent complexity of promoting technology transfer would appear to go some way to undermining the idea that developing countries (excluding BRICS) can speed their development through 'leapfrogging' – benefitting from technological advances in developed countries without undergoing the associated processes of institutional and socioeconomic development. Agenda 21 recognised that successful technology transfer entailed an accompanying assimilation of institutional practices and norms, but seemingly underestimated the difficulty of bringing about institutional change.

Therefore, the central challenge in the promotion of technology transfer remains that set out in Agenda 21 – namely, that ESTs 'are not just individual technologies, but total systems which include know-how, procedures, goods and services, and equipment as well as organizational and managerial procedures'.[67] Transferring an EST from one context to another might mean identifying the precise institutional processes upon which that particular technology is contingent, and recreating the appropriate conditions in a host country. Alternatively, a country-driven approach to technology transfer might entail identifying the precise nature of the host-country context, and selecting an EST to match. Yet in either case a certain disconnect between a given technology and a host-country's environmental and socioeconomic exigencies is arguably unavoidable. While the various measures described above might go some way to closing the gap between the particularities of a host country's environmental and socioeconomic context and the institutional contingencies of ESTs in their many forms, much remains to be done.

If such a diagnosis of the challenges involved is too generalised, any number of potential issues might be raised. Of course, a significant problem concerns the ability of host countries to adequately assess their technological needs and decide upon an appropriate set of ESTs. While there are undeniably grounds to justify the transfer of certain ESTs developed in industrialised countries, in particular in the context of key economic sectors such as manufacturing and transport and the abatement of common pollutants, a lack of expertise might impinge upon a developing country's ability to successfully carry out a TNA.[68] At the macro-economic level,

[63] Ibid.
[64] Ibid.
[65] http://www.business-asia.net/about-us.aspx?P=AboutUs#about
[66] ESCAP (2008), *Regional Study to Guide Policy Interventions for Enhancing the Development and Transfer of Publicly-Funded Environmentally Sound Technologies in Asia and the Pacific Region*, p. 19, http://www.greengrowth.org/download/2009/Regional%20Study%20to%20Guide%20Policy%20Interventions%20for%20Enhancing%20the%20Development%20and%20Transfer%20of%20Publicly-Funded%20Environmentally.pdf
[67] http://www.un.org/esa/dsd/agenda21/res_agenda21_34.shtml
[68] ESCAP (2008), *Regional Study to Guide Policy Interventions for Enhancing the Development and Transfer of Publicly-Funded*

problems might include a lack of access to capital, high levels of investment risk, uncertain inflation or interest rates, and a risk of expropriation.[69] At the human resources level, problems could relate to a lack of information, or an inability to compensate for linguistic and cultural differences between the supplier country and the host country.[70] Further barriers might include poorly functioning markets, a lack of intellectual property protection, insufficient regulation of technology standards, and inadequate science and educational infrastructure.[71]

Way Forward

The capacity of a country to successfully assimilate a transferred to technology tend to be relatively similar to its capacity to innovate by itself.[72] This observation both indicates the sheer scale of the problem and suggests a promising way forward. If developing countries are to be able to successfully adapt ESTs to their own circumstances, it is arguable that what matters most is their own innovative and scientific capacity, which can be strengthened through the development of 'national systems of innovation', or the 'networks of institutions that initiate, modify, import and diffuse new technologies'.[73] Such systems comprise a blend of institutions, public policies, and business and social relationships, resulting in a complex entity that can only result from a country's endogenous development.[74]

Measures that might be taken to fortify national systems of innovation include actively orienting the innovation system towards national sustainable development imperatives, creating a long-term vision of how a country aims to develop, developing a horizontal, holistic approach, and integrating learning into governance practices.[75] This approach relates to objective (c) of Chapter 34 of Agenda 21, 'the promotion of environmentally sound indigenous technologies'.[76] Indigenous ESTs might be especially important for the conservation and restoration of ecosystems through the use of 'soft' technologies including management practices for forests, watersheds and wetlands, and the adaption of production and consumption processes to environmental changes.[77] Ultimately, the imperative is ease of transition from the development of an EST to its transfer, and blurring the very distinction between technology development and transfer could be central to this process.

Environmentally Sound Technologies in Asia and the Pacific Region, p. 44, http://www.greengrowth.org/download/2009/Regional%20Study%20to%20Guide%20Policy%20Interventions%20for%20Enhancing%20the%20Development%20and%20Transfer%20of%20Publicly-Funded%20Environmentally.pdf

[69] Ibid. p. 28

[70] Ibid.

[71] Ibid. p. 29

[72] Ibid. p. 24

[73] Ibid. p. 34

[74] Ibid.

[75] Ibid. p. 17

[76] http://www.un.org/esa/dsd/agenda21/res_agenda21_34.shtml

[77] ESCAP (2008), *Regional Study to Guide Policy Interventions for Enhancing the Development and Transfer of Publicly-Funded Environmentally Sound Technologies in Asia and the Pacific Region*, pp. 6-7, http://www.greengrowth.org/download/2009/Regional%20Study%20to%20Guide%20Policy%20Interventions%20for%20Enhancing%20the%20Development%20and%20Transfer%20of%20Publicly-Funded%20Environmentally.pdf

Chapter 35: Science for Sustainable Development

Introduction

With the world experiencing unprecedented rates of population growth, consumption of natural resources and changes in climate, the role of science has become even more pivotal to sustainable development and environmental protection. The rapid increase in the ease of reproduction and dissemination of information has enabled research and innovation to transcend geographical boundaries, therefore both the potential and expectation for science to act as a primary driving force for sustainable development is considerable.[1]

Science is crucial to providing decision makers with the information necessary to formulate and select effective policies to address the causes of - and develop solutions to - the problems arising from environmental degradation and enable the transition to more sustainable paths of development. Chapter 35 recognises that to fully understand the carrying capacity of the planet and its ability to cope with the impacts of human activity, it is necessary to achieve more comprehensive knowledge of 'land, oceans, atmosphere and their interlocking water, nutrient and biogeochemical cycles and energy flows' which together constitute the Earth system.[2] It was thought that improved capacity for scientific assessment and greater scientific understanding would in turn enable the development of the new technologies and practices essential to increasing the efficiency of resource utilisation and the transition to alternatives, reducing the negative impacts humankind has on the earth. Progresses in science will also simultaneously help to aid and abet development issues such as poverty, health and disease, and access to information.

In light of this, Chapter 35 therefore outlines a series of activities and interventions to strengthen the scientific basis for sustainable management, enhance scientific understanding, improve long-term scientific assessment and build up scientific capacity and capability.

Implementation

Strengthening the scientific basis for sustainable management;

National Science-Policy Interfaces

The two decades following Agenda 21 have seen significant improvements in strengthening the scientific basis for sustainable management. Despite differing from one country to the next, all countries have furthered institutional mechanisms to determine scientific research priorities and ensure science is a key determinant of sustainable development. Although this process has been more efficient in the developed countries the developing countries are also catching up on the trend. Countries which have undertaken processes of rapid industrialisation such as China, India and Brazil, are quickly introducing and increasing the effectiveness of their science-policy interfaces. In the last few years least developed countries like Bangladesh and the Maldives have also show a keener interest and invested in research. International organizations and donors alike have been funding research on various issues related to sustainable development in these countries. Virtually all nations possess scientific ministries and the vast majority of OECD countries have established fully institutionalised independent scientific bodies to specifically provide information and policy advice on environment and sustainable development. Many countries have also established high level scientific advisory positions – for example the UK

[1] UNESCO science report 2010 Executive Summary, p.30.
[2] Agenda 21, Section IV, Means of Implementation, Chapter 35: Science for Sustainable Development

government has appointed an official Chief Scientific Advisor (CSA) and in 2011 introduced legislation to appoint a Chief Scientific Advisor to every government department.[3]

The Chief Scientific Advisors are to "work alongside other analytical disciplines and with departmental boards and Ministers, to ensure robust, joined-up evidence is at the core of decisions within departments and across government".[4] Although having a CSA is popular in developed countries, UK has one in almost every government department, Australia, United States and New Zealand also benefits from having them, it has been questioned if having CSAs are an extravagant expense for poorer developing countries.[5] Governments of most developing countries gather scientific advice and information from their science ministries or national science agencies, this has its drawbacks, science ministries in developing and least developing countries are often underfunded, have inadequate resources and connections and lack the expertise to effective influence other government ministries which are usually more powerful than them.

Amongst the various other programmes that intend to inform and influence policy is the Rural Economy and Land Use (RELU) in the UK which aims to enable researchers to work together to investigate the social, economic, environmental and technological challenges faced by rural areas which can inform policy and practice. This programme promotes interdisciplinary research and is a collaboration between the Economic and Social Research Council (ESRC), the Biotechnology and Biological Sciences Research Council (BBSRC) and the Natural Environment Research Council (NERC) with additional funding provided by the Scottish Government and the Department of Environment, Food and Rural Affairs.[6] Another example is Environment Canada's Atmospheric Science and Technology Directorate also supports the government's air quality policies and regulatory initiatives by providing them with air quality research.[7]

An increasing emphasis on the scientific basis for sustainable development has also seen strategic environmental assessments (SEA) become commonplace, with the EU ratifying a specific SEA directive making the assessments mandatory for all member countries since 2004.[8] Nonetheless, there has been criticism that environmental assessment mechanisms have inordinately privileged socioeconomic concerns at the expense of environmental ones, and are often not sufficiently participatory.[9] For example, a report on the environmental impact assessment (EIA) for the Belo Monte dam in Brazil found it to contain a number of omissions and mistakes, and to seriously underestimate the environmental implications of the project.[10] This being said, the OECD has documented a number of developing countries which have successfully introduced SEA legislation such as the Dominican Republic and Vietnam.[11] In the latter, a SEA was used in the planning of its national hydropower programme, institutionalising widespread processes of consultation between local and national government agencies, as well as non-state actors and

[3] Chief scientific advisers across government, Department for Business Innovation and Skills. Available at: http://www.bis.gov.uk/go-science/science-in-government/chief-scientific-advisers
[4] Chief Scientific Advisers and their Officials: an introduction. Government Office for Science, Available at: http://www.bis.gov.uk/assets/bispartners/goscience/docs/c/10-1294-chief-scientific-advisers-and-their-officials-introduction
[5] Africa Analysis: Who needs chief scientific advisors? Linda Nordling, 2009. Available at: http://www.scidev.net/en/opinions/africa-analysis-who-needs-chief-scientific-advisor.html
[6] Rural economy and land use programme: Introduction. Available at: http://www.relu.ac.uk/about/
[7] About air quality research: Linking policy and decision making. Available at: http://www.ec.gc.ca/air-sc-r/default.asp?lang=En&n=E557B129-1
[8] Global Environment Outlook GEO4, UNEP, 4007, p.390.
[9] 'What's wrong with EIA and SEA anyway? A sceptic's perspective on sustainability assessment', in Journal of Environmental Assessment Policy and Management Vol. 8, No. 1 (March 2006) pp. 19–39
[10] Experts Panel Executive Review of Belo Monte EIA, 2009
[11] Dunn B., Carew-Reid J., Ramachandran P. and Pham A.D. (2009, in prep) SEA of the Quang Nam Hydropower Plan in Central Viet Nam . In (Sadler B. and Nelson P. (eds) SEA Practice in Development, Cooperation, OECD Paris

stakeholders at the community level, resulting in a freeze in the construction of dams in several areas due to the perceived social and environmental costs.[12]
There has also been a proliferation of non-state scientific institutes in all countries. These have been crucial in conducting analyses of national and regional pathways for sustainable development, often working closely with government agencies to feed their findings into decision making processes. Science-based development NGOs in the industrialised world have been instrumental to the growth of similar organisations in the South, with the National Academies in the US for example in 2004 launching the African Science Academy Development Initiative.[13] At the global level, the InterAcademy Panel on International Issues (IAP) was launched in 1993 to develop the capacity and public profile of its member academies across the world, augmenting their ability to use science to influence policy and foster more sustainable processes of consumption and production.[14]

Governments have also become better equipped to assess their own institutional needs in regards to science for sustainable development through the application of the concept of National Systems of Innovation (NIS). Whereas the measurement of efforts to increase scientific capacity have previously focused on the likes of research expenditures and quantifiable outputs, NIS represent an attempt to emphasise the gains from increasing the linkages between the multiple actors involved in science and technology development, including research institutions, government agencies and the private sector.[15] Through a greater appreciation of these relationships, this has enabled most decision makers in the North, as well as some in the South (primarily BRIC) to undertake effective assessments of both national and regional paths to sustainable development. These countries have subsequently been able to better implement strategies and allocate resources according to areas of scientific strength and weakness, as well as attain a greater understanding of their role in international research efforts. This has seen the likes of the Canadian government's International Development Research Centre (IDRC), explicitly place scientific research at the centre of its agenda, sharing its expertise in resource management and ICT technologies with decision makers in the South.[16] In practice, its initiatives have produced results such as 40% child mortality reduction in two Tanzanian Districts, through enabling evidence-based reforms to the health care system.[17]

International Drivers of Science-based Policy
Progress achieved in strengthening the scientific basis for sustainable management at the national level can be directly attributed to the creation and efforts of numerous international scientific research, information and assistance organisations. Perhaps the most prominent is the Intergovernmental Panel on Climate Change (IPCC)[18], which has since its inception called upon over 3,000 scientists and over 40,000 peer-reviewed publications, yielding a historic sequence of global reports on the issues of climate change.[19] These assessments have been instrumental in informing both national and international environment policy, shaping research networks and developing the scientific knowledge of climate change, as well as raising public awareness and the profile of environmental science across the globe.[20] It stands alone in its ability to combine

[12]Challenges of Environmental Mainstreaming, IEED, 2009, pp.71-2.
[13] African science academy development initiative, available at:
http://www.nationalacademies.org/asadi/2008WebSite/AboutASADIOverview.html
[14] The global network of science academics. Available at: http://www.interacademies.net/About.aspx
[15]National Innovation Systems, OECD, 1997, p.3 (http://www.oecd.org/dataoecd/35/56/2101733.pdf)
[16] Royal Society, Knowledge Networks Nations, 2011, p.78; http://www.idrc.ca/EN/AboutUs/WhatWeDo/Pages/default.aspx
[17] Canada's International Development Research Centre. Briefing notes. Available at: http://www.idrc.ca/EN/AboutUs/Documents/idrc-Briefing-Book.pdf, p.11.
[18] Intergovernmental panel on climate change. Available at: http://www.ipcc.ch/organization/organization.shtml
[19] Royal Society, Knowledge Networks Nations, 2011, p.80.
[20] Royal Society, Knowledge Networks Nations, 2011, p.80.

traditional peer-reviewed science with 'grey literature', whilst simultaneously striking a balance between maintaining scientific credibility and being accessible to national governments.[21]

A wide range of global organisations which specifically promote and enhance science for sustainable development policy exist. These include the International Council for Science (ICSU), which aims to 'mobilise knowledge and resources of the international scientific community to strengthen international science for the benefit of society' and possesses members from 141 countries working through multiple interdisciplinary bodies.[22] Under the UN umbrella, a diverse range of scientific organisations with sustainable development objectives exist. These include UNESCO and the UN Committee on Science and Technology for Development (UN-CSTD), which are both a valuable source of information to policy makers in both North and South. In addition, UNEP has significantly improved its ability to help nations establish and enhance scientific infrastructure through its Science Initiative; an ongoing consultative process which has sought to identify and address gaps in its capacity for assessment and assistance.[23]

Enhancing scientific understanding

\Since the beginning of the 21st century, the global spend on research and development in science and technology has nearly doubled, publications have grown by a third, and the number of researchers continues to rise (see Figure 1). As a consequence, notable progress has been made in further understanding the Earth's carrying capacity and the multiple impacts of human activity. Importantly, much of this research and development has strengthened and enhanced long-term scientific assessment, enabling policy-makers at all levels to reach decisions based on a more comprehensive understanding of future scenarios. Integral to these processes is the provision of highly detailed data on trends in natural and human processes, and projections of multiple future scenarios which are an essential resource for sustainability policies operating according to the precautionary principle.

	Spend on research and development		Numbers of researchers	Number of publications
	US$	% GDP		
2007	1145.7bn	1.7	7.1m	1.58m
2002	790.3bn	1.7	5.7m	1.09m

Figure 1: Global Science by Numbers

Source: Royal Society, Knowledge Networks Nations, 2011, p.16.

The IPCC is one of the most comprehensive long-range 'warning systems' developed at the international level. However, several other organisations and mechanisms with more discrete objectives exist to enhance scientific understanding for sustainable development. Until its recent disbandment, the UN System-Wide Earthwatch mechanism attempted to coordinate and catalyse the scientific observation activities of all UN agencies and directly supports environmental research and reporting such as UNEP's Global Environment Outlook initiative – a long-term scientific assessment compiled following extensive consultation and participation from a wide range of stakeholders, also making projections on potential future scenarios using the data it has amassed.[24] These findings are consolidated into written publications, with 4 being released since

[21] Royal Society, Knowledge Networks Nations, 2011, p.82.
[22] International Council for Science. Science for Policy, Available at: http://www.icsu.org/what-we-do/@@category_search?path=/icsu/what-we-do&Subject:list=Science%20for%20Policy
[23] Strengthening the science base for UNEP: Overview of the Science Initiative. Available at: http://www.unep.org/scienceinitiative/
[24] http://www.un.org/earthwatch/about/about.html; http://www.unep.org/geo/about.asp

1997 and GEO5 due to be available imminently. Numerous resources such as the Global Biodiversity Outlook - the flagship publication of the Convention on Biological Diversity – continue to provide policy makers with national, regional and international environment and sustaibality related scientific data and trends.[25]

The WMO continues to function as the UN's leading authority on the analysis of the Earth's atmosphere and how it interacts with the oceans to produce climate and shape water distribution.[26] The WMO also works closely with the Intergovernmental Oceanographic Commission (IOC), UNESCO, UNEP and the ICSU to undertake the Global Climate Observation System (GCOS). The GCOS was established in 1992 to provide comprehensive scientific information on the total climate system to ensure policy makers possess all the information required to address climate-related issues.[27] Outside the UN system, multiple other agencies play central roles in assessing the impacts of humans on natural processes, as well as developing new predictive tools to enable decision makers to make better informed policies on issues of sustainability.

Improving long-term scientific assessment

The Millennium Ecosystem Assessment (MEA) represents a significant contribution to long-term and long-range scientific assessment. It was proposed in 1998 and released its full findings in 2005.[28] Its scientific analysis at both global and sub-global levels demonstrated the clear but complex cause-and-effect linkages 'between relationships embedded in both biophysical and social processes'.[29] Its revelation that some 60% of ecosystem services are being degraded or used unsustainably has been a major scientific driver of government resource use policy throughout the world.[30] These efforts have been complemented by more focused assessment programmes such as the Global International Waters Assessment (GIWA), established in 1999 with funds from GEF as part of UNEP's attempts to strengthen its scientific base. The GIWA continues to carry out comprehensive and integrated analysis of global waters. Through its assessments of the ecological condition of Earth's transboundary water systems, and the causes of the environmental challenges they face, GIWA also seeks to account for possible future global water scenarios and analyse policy options accordingly to inform decision makers.[31]

More recently another UNEP initiative, the International Panel for Sustainable Resource Management, was launched in 2007 to undertake scientific assessments of policy relevance on using natural resources in a sustainable manner, thus attempting to provide the scientific basis for the decoupling of economic growth and resource use from environmental degradation.[32] Through its Prototype Environmental Assessment and Reporting Landscape (PEARL) system, UNEP is also attempting to supply governments and international organisations with a comprehensive overview – from both a geographical and thematic perspective - of the numerous programmes of environmental assessment that have been completed or currently being undertaken globally.[33] In this regard, the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) represents a salient new interface for strengthening the use of science in decision making.[34] The initiative aims to address the gaps in the science-policy interface on biodiversity and ecosystem

[25] http://gbo3.cbd.int/
[26] http://www.wmo.int/pages/about/index_en.html
[27] http://www.wmo.int/pages/prog/gcos/index.php?name=Background
[28] http://www.maweb.org/en/About.aspx#
[29] Global Environment Outlook GEO4, UNEP, 4007, pp364-5.
[30] Global Environment Outlook GEO4, UNEP, 4007, p.366.
[31] http://www.unep.org/dewa/giwa/giwafact/giwa_in_brief.asp
[32] http://www.unep.org/resourcepanel/Introduction/tabid/54040/Default.aspx
[33] http://www.unep.org/pearl/Default.aspx
[34] http://ipbes.net/about-ipbes.html

services through synthesising information on a range of global environmental conventions and developing policy dialogues.[35]

Outside the UN framework, the Group on Earth Observations (GEO) was created in response to the 2002 WSSD calls for greater integration of efforts to advance global monitoring systems. In its attempts to implement a Global Earth Observation System of Systems (GEOSS), the GEO represents a major achievement in the provision of a framework in which state and non-state actors can collaborate to devise and implement monitoring initiatives on a comprehensive range of areas to improve issues such as water resource management, the impact of natural disasters and the loss of biodiversity.[36] Numerous other global initiatives to better understand the Earth's carrying capacity are more scientific in scope, such as the International Geosphere-Biosphere Programme (IGBP), a subsidiary of the ICSU, which conducts extensive research into the planet's biogeochemical cycles with regards to how they are impacted by human activity and their causal relationship to overall trends in global environmental change.[37] Another important example is the International Energy Association (IEA), which provides comprehensive data and analysis on energy trends with a view to furthering international engagement on issues of energy security, economic development and climate change.[38]

Projects of this nature have been primarily driven and executed by Northern actors. However, as those most likely to experience the effects of climate change in the soonest time and with the greatest impact, developing countries have been driven by these concerns to also engage in attempts to audit their national and regional territories more closely. This has occurred with the assistance of the North such as the African Union and European Union's Kopernicus-Africa space project for monitoring environment and security, or more increasingly through Southern collaborations such the design of Earth observation satellites by China and Brazil. [39] Improvements in the scientific understanding of farming processes have been led by the Consultative Group on International Agricultural Research (CGIAR), providing tangible results for sustainable development. It has been estimated that for every $1 it has invested in research, '$9 worth of additional food is produced in developing countries'.[40] It utilises Consultative Group (CG) Centres, such as the International Rice Research Institute (IRRI) in the Philippines, which are said to be central to the engagement and mobilisation of local communities, harnessing knowledge at this level to drive, enrich and broaden the scope and impact of their research.[41] Conversely, however, critics of CGIAR have emphasised that an increasingly strong alliance with global business has seen it favour a top-down approach to agricultural research which favours quantity over sustainability, ignoring the knowledge, experience and interests of small holders and Indigenous Peoples in the process.[42]

The science of sustainable energy

Since the 1992 Rio Summit, increases in the global demand for energy and the production of greenhouse gasses from fossil fuel use has prompted countries in both the North and South to invest heavily in R&D in the production of energy from renewable sources. This has been particularly prominent in the last decade with advances in wind power technology, for example, seeing its global energy output increase by approximately 200% in the last decade (2002-2011)

[35] http://ipbes.net/about-ipbes.html
[36] http://www.earthobservations.org/about_geo.shtml
[37] http://www.igbp.net/page.php?pid=100
[38] http://www.iea.org/about/index.asp
[39] UNESCO science report 2010 Executive Summary, p.30.
[40] Royal Society, Knowledge Networks Nations, 2011, p.84.
[41] Royal Society, Knowledge Networks Nations, 2011, p.84.
[42] http://www.lobbywatch.org/profile1.asp?PrId=295

compared with the previous ten years (1992-2011).[43] China has recently overtaken the US as the biggest spender on sustainable energy, yet both continue to invest heavily in renewables, introducing green stimulus packages in 2009 of $67.7 billion and $67.2 billion respectively.[44] Nevertheless, despite renewable energy today accounting for around a quarter of global electricity supply, concerns remain that this share is still too low when considering the detrimental effects fossil fuel extraction and use – as the primary means of energy generation - continues to have on the environment.[45] Carbon Capture and Storage (CCS) technologies have also increasingly become a scientific priority in the industrialised world since the 2005 G8 Summit in the UK. CSS efforts have been led by the International Energy Agency (IEA), Carbon Sequestration Leadership Forum (CSLF), with a Global CCS Institute being created in 2009. Nonetheless CCS is currently still only at the demonstration phase and whilst the IPCC has indicated that it can play role in climate change mitigation, concerns still exist regarding its non-permanence, expense and regulation.[46]

Building up scientific capacity and capability.

In 1990, over 95% of Research and Development (R&D) was carried out in developed countries, virtually all of which in just seven OECD economies.[47] In the last two decades, however, there has been a significant shift in the global distribution of R&D efforts, with this figure falling to below 83% and 76% by 2002 and 2007 respectively.[48] This is not because the scientific capacity of the world's most developed nations has decreased – it has continued to rise incrementally in the vast majority of these countries – rather it is largely due to the rapid economic and technological development in the likes of Mexico, South Africa, Brazil, India and China. This applies to the capabilities of both state and non-state bodies. Scientific output can be seen as a clear indicator of this progress, with the Chinese Academy of Sciences - for example - becoming the planet's most prolific publisher of scientific research, producing over 50,000 papers from 2004 to 2008.[49] The augmentation of scientific capabilities in some poorer countries has also been notable, with the governments of both Rwanda and Mozambique explicitly stating that science and technological innovation represent 'full-scale blueprints for development'.[50] Nonetheless despite some real progress in the scientific capabilities of most low-income countries, these examples are predicated on future development plans, with most LDCs still unable to effectively compete in the science and technology global marketplace.

Overall numbers of scientists in the developing world have also increased significantly. Two countries in which this is has been especially prominent are India and China. In India this has occurred as a result of the establishment of 30 new universities since 2007, predicted to raise student enrolment from less than 15 million to 21 million by 2012.[51] China, along with many other countries, has substantiated efforts to secure the return of a significant number of scientists from its diaspora communities in the developed world, with its 2008 Thousand Talents Program bringing over 600 academics back to the country through offering a range of personal and professional benefits.[52] As prescribed by Chapter 35, there has also been a rise in the number of female scientists in the South, with membership of bodies such as the Organisation for Women in

[43] http://www.ren21.net/Portals/97/documents/GSR/GSR2011_Master18.pdf, p.20
[44] http://www.un.org/esa/dsd/resources/res_pdfs/ga-64/SGreport_on_new_%20renewable_sources_of_energy.pdf, p.19
[45] http://www.ren21.net/Portals/97/documents/GSR/GSR2011_Master18.pdf, p.11; http://www.un.org/esa/dsd/resources/res_pdfs/ga-64/SGreport_on_new_%20renewable_sources_of_energy.pdf, p.1
[46] http://www.ipcc.ch/pdf/special-reports/srccs/srccs_summaryforpolicymakers.pdf
[47] UNESCO science report 2010 Executive Summary, p.9
[48] UNESCO science report 2010 Executive Summary, p.9
[49] Royal Society, Knowledge Networks Nations, 2011, p.37.
[50] royal society, science: an undervalued assest in governance for development, p.2
[51] UNESCO science report 2010 Executive Summary, p.5
[52] Royal Society, Knowledge Networks Nations, 2011, p.27.

Science for the Developing World (OWSDW) continuing to grow exponentially.[53] The International Centre for Theoretical Physics (ICTP) also remains a key instrument for the training of scientists in the developing world. Through its direct links with universities in the South, its programmes of study represent 'a major force in stemming the scientific brain drain from the developing world'.[54]

Access to the wide range of scientific information necessary to better inform decision makers on issues of sustainability has also been greatly improved since 1992. Resources such as the Science Development Network have emerged as an important source of independent and reliable information on science and technology for the developing world, providing decision makers, researchers and civil society with statistics and policy recommendations on a comprehensive range of scientific topics.[55] The organisation also enhances developing nations' capacities for communicating science and technology through its regional networks of experts, scientific bodies and specialist workshops. Although created prior to the Rio Summit, the Academy of Sciences for the Developing World (TWAS) also remains a key mechanism for facilitating communication between scientists primarily from the South. Funded by UNESCO and various G8 governments, it currently possesses approximately 1000 merit-based members from around 70 countries that are provided with financial and technical support to enable them to achieve excellence in their research fields and directly promotes South-South and South-North cooperation within the field.[56] Similarly, the Online Access to Research in the Environment (OARE), an international public-private consortium launched in 2006 and coordinated by UNEP, Yale University, and other leading science and technology publishers, represents a valuable source of scientific research for decision makers, academics and civil society in low-income countries.[57]

The private sector continues to make a significant contribution to the development of scientific capacity for sustainable development in both the North and South. Nonetheless additional effort has been made to ensure that the R&D undertaken by business is of greater benefit to global, national and local environmental programmes. The 2000 Malmö Ministerial Declaration emphasised the need for further scientific capacity to bring about circular national economies. [58] This involves using technology to transform production cycles to see by-products become a usable resource to be fed back in the process. In response, UNEP and the Society for Environmental Toxicology and Chemistry (SETAC) launched an International Life Cycle Partnership, known as the Life Cycle Initiative to support the mainstreaming of this process.[59] The Initiative constitutes a network of over 2,000 members representing industry, government, academia and the service sectors to develop research and share best practices in using science to implement Life Cycle approaches.

Challenges and Conflicts

Persistent governance issues

Numerous barriers to and disjunctures within governance processes at the global, regional and national level have all continued to undermine efforts to strengthen the scientific basis for sustainable management.[60] These can be spacial in nature, in which the technological needs of

[53] http://www.twows.org/
[54] http://www.ictp.it/about-ictp.aspx
[55] http://www.scidev.net/en/content/overview/
[56] http://www.twas.org/
[57] http://www.oaresciences.org/about/en/index.html
[58] http://www.unep.org/malmo/malmo_ministerial.htm
[59] http://lcinitiative.unep.fr/default.asp?site=lcinit&page_id=9FDF7FDF-261F-4F0E-A8E3-5FF4E16B33C2
[60] Global Environment Outlook GEO4, UNEP, 2007, p.390.

sustainable development initiatives at the local level are not supported by wider scientific preferences for development. For example, whilst the IPCC remains the most authoritative source of scientific information on issues relating to climate change, it provides information mainly on broad trends rather than on more localised impacts of climate change. This makes it useful for global decision-making but less so for planning climate adaptation strategies. Efforts are being made to address this, but they remain in development, such as the regional centres on climate change agreed in 2010 by the UNFCCC at the Cancun Summit.

There is also a temporal disjuncture between the development of scientific knowledge and assessment, and the often considerable amount of time it takes to implement policies based on this information, at which point the science has potentially moved on thus rendering the policies at best inefficient, or at worst detrimental to the environment or development. This has been pertinently displayed by further research into the full life-cycle of biofuels, revealing that the energy and land they require to produce – a process which has in many cases been passed on to developing countries at the expense of primary forest and ecosystem conservation - are in many cases greater than the reductions in CO2 emissions they supposedly produce.[61] This study, however, was only published after the EU had set ambitious targets to increase biofuel use.[62]

The incoherence of global scientific resources

Internationally, governance remains somewhat fragmented due a lack of integration and coherence between the plethora of global agencies attempting to assist countries with the assessment of their scientific knowledge and research needs, as well as how to subsequently develop institutions to mainstream science in policy making processes.[63] The level and scope of technical assistance in this regard still varies considerably, often resulting in inconsistent or even conflicting policies being implemented. This lack of coordination at the international level also makes the processes required for greater integration of science into sustainable development policies more expensive, with political differences still limiting international cooperation in the field and resources being inefficiently allocated. In these respects, UNEP still has a considerable way to go before it can be considered a fully integrated and easily accessible authority on science for sustainable development, with its Science-Policy Interface an important tool for this process. In addition, UNESCO has received specific criticism for being too concerned with 'social' science and neglecting more 'hard' scientific research and policy recommendation programmes, considering its unique mandate for the promotion of science within the UN.[64] A recent independent review found the organisation's Natural Science programmes to lack transparency, prominence and insufficiently demonstrate their impact.[65]

Many developing countries still lack the institutionalised channels to enable or compel decision makers to interact with the scientific community, such as 'scientific advisory councils, national academies of science, or dedicated science advisors'.[66] In Africa for example, Uganda is one of only a few countries to have an independent Science and Technology Parliamentary Committee to scrutinise legislative processes.[67] In South Africa these deficiencies proved catastrophic when President Thabo Mbeki, acting on personal beliefs and advice from advisors with a flawed scientific basis, refused to implement internationally agreed policies on the prevention and

[61] http://www.iema.net/news/envnews?aid=18088
[62] http://www.iema.net/news/envnews?aid=18088
[63] Emerging Forces in Environmental Governance Edited by Norichika Kanie and Peter M. Haas (2004), p. 70
[64]Summary of findings, Report on the first phase of the Committee's 2006 UNESCO Independent Review of Natural, Human and Social Science Programmes. http://unescoscience.blogspot.com/2006/09/unesco-overall-review-of-its-science.html
[65]Summary of findings, Report on the first phase of the Committee's 2006 UNESCO Independent Review of Natural, Human and Social Science Programmes. http://unescoscience.blogspot.com/2006/09/unesco-overall-review-of-its-science.html
[66] royal society, science: an undervalued asset in governance for development, p.2
[67] royal society, science: an undervalued assest in governance for development, p.2

treatment of HIV/AIDS. Not until 2007, largely as a result of efforts by the Academy of Science South Africa as well as growing international pressure did South Africa reform its healthcare system and improve the scientific checks and balances on the executive.[68]

Barriers and shortcomings in scientific knowledge and assessment

Agenda 21 called for a deeper understanding of numerous extremely complex biophysical cycles and intricate ecosystem dynamics.[69] Analysis is further complicated by the diverse and often unintended influence many different human activities have on these processes, and the inherent limitations in scientific models being able to take into account a vast range of variables. The translation of such technical information into workable policy therefore remains a critical challenge. Persistent uncertainties and the propensity of knowledge to change rapidly also mean that the scientific understanding of environmental change is still relatively incomplete, with shortfalls in understanding in some crucial 'biophysical processes and ecosystem dynamics', as well as existing knowledge not being fully integrated. [70] Prohibitive costs continue to limit the development and implementation of far reaching global systems of evaluation for both natural and anthropological processes. For example despite clear improvements, scientific assessment remains relatively inadequate in the prediction of natural disasters - themselves an increasingly prominent phenomenon.[71]

The effects of these deficiencies have been multiplied by the occasional but nonetheless high-profile inaccuracies in certain scientific reports. A prominent example being the IPCC's Fourth Assessment report, which was found to contain a small number of mistakes, providing fuel for climate change sceptics and much negative media coverage which significantly damaged the reputation of the organisation.[72] This exhibits how the IPCC and other global projects of this nature continue to be challenged by the political diversity of their member states, as well as the organisation and collation of vast amounts of highly complex data from a wide range of sources.

Similarly, many prominent decision makers and business leaders have continued to use gaps in scientific understanding to deny the credibility of findings revealing unprecedented rates of environmental degradation as a result of human activities.[73] This has had major implications for environmental policy at all levels, especially with regards to the achievement of more comprehensive commitments and ambitious targets proposed at international conferences on environment and sustainable development. Furthermore, this remains a significant barrier to the precautionary principle being fully integrated into norms of governance at the national level, seeing environmental policies in general remain reactionary, rather than more preventative in nature.

Political Considerations

Irrespective of recent controversies, IPCC reports represent the most comprehensive and collaborative climate change research efforts ever undertaken and continue to receive the backing of the vast majority of the scientific community.[74] Even when taking into account the large data ranges and uncertainties involved, the most optimistic scenarios still emphasise the importance of

[68] royal society, science: an undervalued assest in governance for development, p.2
[69] Global Environment Outlook GEO4, UNEP, 4007, p.366.
[70] Global Environment Outlook GEO4, UNEP, 4007, p.366.
[71] http://www.wmo.int/pages/prog/drr/
[72] Royal Society, Knowledge Networks Nations, 2011, p.80.
[73] See Robert F. Kenney Jr., Crimes Against Nature: How George W. Bush and Corporate Pals are Plundering the Country and Hijacking Our Democracy (2005); Al Gore, The Assault on Reason, (2007)
[74] http://royalsociety.org/uploadedFiles/Royal_Society_Content/News_and_Issues/Science_Issues/Climate_change/climate_facts_and_fictions.pdf

keeping global temperature increases below 2°C.[75] Yet voluntary CO2 reduction targets set at recent international climate change negotiations will struggle to keep temperatures below this threshold, suggesting that more ambitious environment and sustainable development policies are prevented by political factors, rather than deficiencies in scientific knowledge and assessment[76]. This can be directly attributed to the political short-termism displayed by decision makers in both North and South, whose decisions are primarily governed by the pursuit of economic growth vis-à-vis increasing GDP, and therefore seeing the environment and long-term sustainability remain externalised.

Costs

In most developing countries, institutional and human resource capacities continue to constrain progress towards greater scientific capability. In Africa for instance, a significant number of countries are dedicating less than 0.1% of GDP to R&D.[77] Moreover many governments remain constrained by the need to primarily allocate resources for basic social provisions such as food, basic education and healthcare. As a consequence, the infrastructural and communications facilities upon which capacity building and effective scientific outputs depend - such as high speed internet access for instance – continue to be absent. Similarly, tertiary education in many countries has not increased in number or quality as rapidly as primary and secondary education provision.[78] This places clear limitations on the quantity of scientists a country is able to produce and the level of understanding they are able to achieve. Many cultures also enforce preconceived notions on the role of women in society, thus severely limiting the number of female researchers and scientists.

Barriers to sustainable energy

Whilst the science of renewable energy production has improved significantly since 1992, especially in the last decade, its relative expense when compared with fossil fuels means that its usage continues to lag behind cheaper, less sustainable alternatives in virtually all countries. In the energy sector investment in R&D is relatively low, at around 0.5% of turnover, placing much of the burden of investing in new technologies on the public sector. Yet at the global level, public commitments to energy R&D have actually declined since the 1980s.[79] Those nations which have invested most heavily in renewable energy also tend to be those with the greatest rates of energy consumption and fossil fuel use.[80] What's more, outside of the BRIC nations, the vast majority of developing countries have energy development programmes based 'almost exclusively on conventional energy sources', thereby lacking adequate institutional frameworks and possessing weak or inexistent policies to support renewable energy development.[81] A remaining challenge is therefore ensuring an adequate flow of finance and technology from those countries leading the way in renewable energy production, as well ensuring that they themselves implement policies which promote movement away from dependence on fossil fuels. This ties in closely to the views of many environmental groups arguing against investing heavily in initiatives such as CCS which fail to address the root causes behind untenable levels of CO2 in the atmosphere. [82] Furthermore, mitigation based activities of this nature provide decision makers with an opportunity to avoid more systemic adaptation-oriented policies which would have a far bigger impact on green house gas reduction and other associated environmental issues.

[75] http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-spm.pdf
[76] http://southasia.oneworld.net/globalheadlines/rich-nations-evade-climate-change-responsibility-poor-ones-shoulder-the-burden
[77] royal society, science: an undervalued assest in governance for development, p.2
[78] royal society, science: an undervalued assest in governance for development, p.4
[79] http://webarchive.nationalarchives.gov.uk/+/http://www.hm-treasury.gov.uk/stern_review_report.htm, p. 371
[80] http://www.un.org/esa/dsd/resources/res_pdfs/ga-64/SGreport_on_new_%20renewable_sources_of_energy.pdf, p.19
[81] http://www.gnesd.org/Downloadables/RETs_II/RETs_II_spm.pdf, p.5
[82] http://www.greenpeace.org/international/Global/international/planet-2/report/2007/10/CCS-briefing.pdf;

Brain Drain

A similar constraint to the enhancement of scientific capabilities in low income countries is the loss of human capacity through 'brain drain'. Nations which lack quality higher education establishments and training facilities tend to see many of the best students travel abroad. Concerns around economic and political stability see both students and qualified scientists leave the country to further their careers in less politically volatile and more economically lucrative nations. Similarly, top scientists will both need and desire to work in environments with the latest technologies and resources to undertake the largest/most interesting projects, which most Southern countries cannot provide. These issues have been especially prevalent in Sri Lanka, whose National Science Foundation found that the number of its economically active scientists fell from 13,286 to 7,907 between 1996 and 2006.[83]

Way Forward

Further institutionalising science for sustainable development

Despite progress made in many countries, most would still benefit from the further strengthening of institutional mechanisms at the national level to ensure that science provides the basis for all sustainability policy considerations. To more effectively address global challenges, both scientists and policy makers in all countries must develop a better understanding of the diversity of local contexts for the production and use of expert knowledge.[84] These could be greatly assisted through the development of country or region-specific methodologies for the assessment of scientific knowledge and research needs. Conventional science, technology and innovation (STI) indicators, such as levels of investment in R&D, number of researchers, scientific publication and patent outputs, are undoubtedly important, but are not necessarily the most useful indicators for assessing and understanding national scientific capacities in current contexts.[85] Although this process of scientific assessment has been mainstreamed in most developed countries, it is yet to be understood and effectively implemented by the developing and least developed countries. Developing countries should therefore not simply rely upon the adoption of indicators developed both by and for OECD countries, but rather develop their own means of assessing their national scientific capabilities.[86] In this regard, the New Partnership for African Development (NEPAD) is currently implementing an African Science, technology and Innovation Indicators (ASTII) programme to more effectively survey the continent's progress, an initiative that could be successfully replicated in other regions.[87]

Enhancing global integration

At the international level, the integration of the many disparate often single-issue science organisations and programmes could serve to further enhance and institutionalise the efficiency of the support they provide to governments. This would appear to be important within the UN system, especially regarding the apparent lack of coherence displayed by UNEP's multiple science initiatives. The global and collaborative nature of the IPCC suggests it must also continue to play a leading role, but to do so it could benefit from certain reforms to increase its coordination with UN efforts, as well as bolster its own capacity and scientific integrity. This could involve the Panel altering its governance framework and implement new decision making structures to heighten its responsiveness, potentially through the creation of an executive

[83] UNESCO science report 2010 Executive Summary, p.11.
[84] Royal Society, Knowledge Networks Nations, 2011, p.82.
[85] Freeman, C. and Soete, L. (2009) Developing science, technology and innovation indicators: What we can learn from the past. Research Policy 38 (4), pp. 583–589.
[86] Tijssen, R. and Hollanders, H. (2006) Using science and technology indicators to support knowledge-based economies. *United Nations University Policy Brief 11*.
[87] http://www.nepad.org/humancapitaldevelopment/astii/about

committee comprising of IPCC members, NGOs, academics and the private sector.[88] It could also increase the transparency of
many of its processes and procedures.

Science for enhancing agricultural productivity

The 2000-2001 World Resources Report prepared by the United Nations, the World Bank and the World Resources Institute, described that "humans have become a major force of nature, largely because of the success of science-based technologies in extracting the earth's resources without proper concern for the environmental consequences" it then wrote how science, now, also has a crucial role to play in helping us avoid the impending catastrophe.[89] Nowhere is this better demonstrated than in the need for science in developing sustainable agricultural systems. With advances in science, we have exploited our lands with added vigour, starting from the excessive use of fertilizers to increase productivity to switching over to monoculture which strips the land of its nutrients. However, there have been definite advances in science and a few groups have been working towards sustainable agriculture. The consultative Group on International Agricultural Research (CGIAR) developed the international agricultural research system since the early 1970s, to research on major advances in crop production, increasing dependence of developing country farmers on multinational seed and fertilizer corporations, and concerns about lack of attention to the strengths of local agro–ecosystems.[90] CGIAR's International Maize and Wheat Improvement Center (CIMMYT) developed crop breeding and testing systems in the 1990s that involve a mix of farmer practices, indigenous knowledge of crops, and modern breeding methods. CIMMYT scientists work with farmers to test various models of integration to identify those that can most efficiently and effectively tap into the multiple knowledge of these various players in the development of useful technologies. CSIRO's new Agricultural Sustainability Initiative also looks at how landholders can shift their approach to farming and reduce their impact on the environment.[91] Their priority research areas include: reducing greenhouse gas emissions from farms and increasing carbon storage, adapting farming systems to reduce irrigation water availability, investigating soil health as a foundation for sustainable agriculture, etc. Adapting to the impacts of climate change is a growing concern for farmers all across the world and integrating of sustainable forms of agriculture is thus the best way forward.

The Science of Energy Production

To reach both national and international CO2 reduction targets it will be necessary to further develop the scientific understanding of alternative energy processes, which could in particular enable the creation of more efficient renewable facilities at a lower cost. This will require both governments and industry to further increase the allocation of resources for alternative energy R&D - a process which could itself benefit from more public-private partnership schemes, especially at the national level.[92] Some studies contend that global public energy R&D funding alone will need to double to around $20 billion per year to accelerate the development of a diverse portfolio of technologies.[93] Innovations here are also likely to be faster and more effective if emerging economic and scientific powers become part of a more collaborative international R&D process – something which China in particular has already been keen to lead on.[94] At a technical level, the efficiency of renewable energy would directly benefit from further advancements in the long term scientific assessment of the Earth's biogeochemical cycles.

[88] Royal Society, Knowledge Networks Nations, 2011, p.81.
[89] http://www.sirc.org/articles/sustainable_agriculture.shtml
[90] http://www.pnas.org/content/100/14/8086.full.pdf+html
[91] http://www.ecosmagazine.com/?act=view_file&file_id=EC141p33.pdf
[92] http://www.un.org/esa/dsd/resources/res_pdfs/ga-64/SGreport_on_new_%20renewable_sources_of_energy.pdf, p.1
[93] http://webarchive.nationalarchives.gov.uk/+/http://www.hm-treasury.gov.uk/stern_review_report.htm, p. 347
[94] http://www.un.org/esa/sustdev/sdissues/energy/op/beijing_re_egm/beijing_re_report.pdf, p.viii

Experts and information from the WMO, for instance, could play a leading role in the in the planning and undertaking of research into more advanced wind and tidal energy production technologies.

Policies and funding programmes which specifically attempt to facilitate the transfer of these technologies to developing countries will also expedite their mainstreaming into conventional energy markets. In the South – especially in those nations which remain particularly underdeveloped such as in large areas of sub-Saharan Africa – renewables could provide both reliable and affordable energy supplies and services, particularly in rural areas, whilst simultaneously facilitating myriad income-generating activities.[95]

Closing the economic circle through leapfrogging

The birth of the technological era has seen 'scientific knowledge (become) the main driving force of growth, innovation and economic productivity'.[96] Significant augmentation in the stock of readily available global knowledge, such as in the fields of digital and nanotechnology mean that with adequate funding and assistance countries formerly lagging behind in scientific capacity can grow at a faster rate than more advanced nations without necessarily having to heavily invest in expensive research processes.[97] This provides a significant opportunity for Southern nations to decide which specific areas of science most suit their national context and subsequently embark on a more sustainable and productive development path. Nonetheless, the socio-economic gains of this scientific 'leapfrogging' are contingent upon institutional capacity building which enables a wide range of stakeholders to access the technological and financial benefits it can bring. This is especially important at the local level, to ensure those groups with the least scientific capacity are not further marginalized, as well to conversely allow local knowledge to be harnessed to support processes of technological advancement.[98]

[95] http://www.un.org/esa/dsd/resources/res_pdfs/ga-64/SGreport_on_new_%20renewable_sources_of_energy.pdf, p.19
[96] Implementing Agenda 21:Report of the Secretary General, UN Economic and Social Council, 2002, p.46.
[97] UNESCO science report 2010 Executive Summary, p.11.
[98] http://webarchive.nationalarchives.gov.uk/+/http://www.hm-treasury.gov.uk/stern_review_report.htm, p. 518

Chapter 36: Promoting education, public awareness and training

Introduction

Education is a cornerstone of sustainable development; it transmits the skills and knowledge needed to improve health, livelihoods and promote sound environmental practices. Agenda 21 acknowledged the importance of meeting basic educational needs including the provision of primary education to 80% of children and a halving of 1990 illiteracy rates by the year 2000. This reflects the broader international development goals of the 1990s. The Education for All (EFA) movement was founded in Jomtien, Thailand in March 1990 at the World Conference on EFA. Months earlier UNESCO adopted an action plan to eradicate illiteracy by the year 2000. This was followed in 1991 by the UNESCO International Consultative Forum on EFA which encouraged the adoption of national strategies for achieving the Jomtien goals. The 1990s focus on fulfilling basic education needs is unsurprising given the poor state of global education at the time. In 1992 when Agenda 21 was agreed, illiteracy rates in low-income countries such as Burkina Faso, India and Nigeria were as high as 86% and rates of completion of primary education were as low as 15% in Benin and the Yemen Arab Republic.[1]

Agenda 21 also looked beyond basic educational needs, outlining the necessity of using formal and informal education as tools for achieving environment and development awareness and building the skills necessary for sustainable lifestyles. The concept of re-orientating education towards sustainability and developing specific environment and development training was in its infancy in the 1990s. Education for Sustainable Development (ESD) had been touched upon in the Bruntland Report (1987) and *Caring for the Earth*, the second World Conservation strategy (1991). However, Chapter 36 of Agenda 21 represented the first radical call for action on education as a vehicle for sustainability and provided a basis for international collaboration and investment in learning for change.[2] Chapter 36 of Agenda 21 outlined three specific programme areas for action, all of which will be analysed in the sections that follow:

- Re-orientating education towards sustainable development
- Increasing public awareness
- Promoting training

Implementation

After the Earth Summit in 1992, UNESCO was appointed as the 'Task Manager' for Chapter 36 of Agenda 21. In this role, UNESCO was responsible for coordinating the activities of all stakeholders in relation to education for sustainable development and for supporting the formation of national strategies and action plans for education to further sustainability goals. These objectives still underpin the work of UNESCO today. The most significant step taken towards the implementation of all programmes under Chapter 36 was the World Summit on Sustainable Development that took place in Johannesburg in 2002. The resulting Johannesburg

[1] UNESCO, (1993) *Status and trends: Education for All*, URL: http://www.unesco.org/education/pdf/27_111.pdf

[2] D. Tilbury (2010) *Are we Learning to Change? Mapping Global Progress in Education for Sustainable Development in the Lead Up to 'Rio Plus 20'*, University of Gloucestershire, URL: http://insight.glos.ac.uk/sustainability/news/Documents/Are%20We%20Learning%20to%20Change%20Mapping%20Global%20Progress%20in%20ESD%20%20in%20the%20Lead%20Up%20to%20Rio%20Plus%2020%20D%20Tilbury.pdf

Plan of Implementation reenergised efforts to operationalise Chapter 36, emphasising that education is an indispensable element of achieving sustainability.[3]

The Johannesburg Summit led to the adoption of resolution UN GA 57/254, which established the UN Decade of Education for Sustainable Development (DESD). The DESD, also managed by UNESCO, is a core element of the implementation of Chapter 36 and is intended to act as a *'global platform to embed ESD in all learning spheres and develop initiatives that can showcase the special role of education for sustainable development*.'[4] The DESD has not been the only means of promoting and implementing the goals of Chapter 36; the Millennium Development Goals (particularly MDGs 2, 3 and 7) provide tangible and measurable goals for development, of which education is a significant input and indicator; the Education for All (EFA) movement focuses on ways of providing educational opportunities to everyone; and the UN Literacy Decade (UNLD) concentrates on promoting literacy as the key learning tool that will underpin all education including sustainable development.[5] But the DESD is the initiative which is most overtly working to reorient education towards the achievement of a more sustainable world.

The DESD is being monitored according to ten year global milestones established by UNESCO's International Implementation Scheme. The Monitoring and Evaluation Expert Group (MEEG) that oversees the Scheme will make its final report to the UN General Assembly in 2015. It is at this point that the implementation of Chapter 36 can be fully assessed. However, the following sections provide a snapshot of progress to date as well as short case studies that showcase examples of national and international implementation initiatives.

Promoting education

The goals of providing universal basic education and eradicating illiteracy, agreed by 150 countries at the World Conference on Education for All (EFA) in 1990 and reaffirmed in Chapter 36 of Agenda 21, are still far from realised. In 2008, 67 million children were out of school and 17% of the world's adult population lacked basic literacy skills.[6] Discrimination in education provision also persists.[7] Women and girls continue to face significant obstacles: nearly two thirds of 796 million adults without basic literacy skills in 2008 were women.[8] Education for sustainable development cannot be meaningfully achieved without universal access to basic education. In this sense, the foundations necessary for the implementation of Chapter 36 do not yet exist globally.

However, progress on re-orientating national education strategies towards sustainable development has been more successful. According the Mid-Decade report of the Monitoring and Evaluation Expert Group (MEEG) who are monitoring the progress of the DESD, by 2008 all participating countries had 'sustainable development' mentioned in constitutions and/or national policy documents, and 78 countries had established national ESD coordinating bodies.[9] Although it is worth noting that Europe and North America made more progress than other regions.

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[3] UN Department for Social and Economic Affairs (2002) *Plan of Implementation of the World Summit on Sustainable Development*, URL: http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/WSSD_PlanImpl.pdf

[4] D. Tilbury (2010) *Are we Learning to Change? Mapping Global Progress in Education for Sustainable Development in the Lead Up to 'Rio Plus 20'*, University of Gloucestershire, URL: http://insight.glos.ac.uk/sustainability/news/Documents/Are%20We%20Learning%20to%20Change%20Mapping%20Global%20Progress%20in%20ESD%20%20in%20the%20Lead%20Up%20to%20Rio%20Plus%2020%20D%20Tilbury.pdf

[5] United National, Millennium Development Goals, URL: http://www.un.org/millenniumgoals/

[6] UNESCO (2011) *Tenth Meeting of the High-Level Group on Education for All (EFA)*: *JOMTIEN STATEMENT*, URL: http://unesdoc.unesco.org/images/0019/001919/191931e.pdf

[7] ibid

[8] ibid

[9] UNESCO (2009) *Learning for a sustainable world: Review of Contexts and Structures for Education for Sustainable Development*, URL: http://www.uni-graz.at/rce/documents/downloads/UNESCO_DESD_Complete_report_09.pdf

Coordinating bodies were responsible for overseeing national strategies for integrating education on sustainable development into formal and informal education. These bodies commonly had broad representation, as recommended by Chapter 36, consisting of government representatives, formal education stakeholders and NGO representatives.[10] Less commonly, the private sector was also invited to participate. There is widespread variance on the seniority of representatives on national coordinating bodies though; countries including the UK and Australia have Ministerial representation but this is by no means the norm.[11]

At a country-level, the implementation of sustainable development into the primary and secondary education system has generally been managed in one of three ways. ESD has been integrated directly into existing curricula (e.g. as in France, Germany and the UK) and requires an interdisciplinary approach; ESD has been introduced as an additional educational activity, e.g. as part of an after school club (this approach has been taken in Israel, Bulgaria and Monaco); or decision-making about the incorporation of ESD has been devolved to school leadership.[12] ESD is particularly important in Europe, as the continent with the highest concentration of industrialised nations in the world. In Europe, the promotion of ESD within the education system has taken place at different paces in different countries. As shown in the table below, stage 3 countries (mostly northern Europe) have successfully incorporated ESD in existing education systems, whereas stage 1 countries (mostly eastern and southern Europe) have had little success in promoting ESD.[13]

[10] ibid
[11] ibid
[12] W. Leal Filho (2010) *An Overview of ESD in European Countries: What is the role of National Governments?*, Hamburg University of Applied Sciences, URL: http://www.londonmet.ac.uk/fms/MRSite/acad/lmbs/RESEARCH%20CENTRES/CIBS/Publications/An%20Overview%20of%20ESD%20in%20European%20Countries_WalterLeal.pdf

[13] W. Leal Filho (2010) *An Overview of ESD in European Countries: What is the role of National Governments?*, Hamburg University of Applied Sciences, URL: http://www.londonmet.ac.uk/fms/MRSite/acad/lmbs/RESEARCH%20CENTRES/CIBS/Publications/An%20Overview%20of%20ESD%20in%20European%20Countries_WalterLeal.pdf

Stage 1 (initial)	Stage 2 (intermediary)	Stage 3 (advanced)
Albania	Bulgaria	Austria
Albania	Croatia	Belgium
Armenia	Israel	Cyprus
Azerbaijan	Liechtenstein	Czech Republic
Belarus	Luxembourg	Denmark
Bosnia and Herzegovina	Monaco	Estonia
Georgia	Romania	Finland
Kazakhstan	Russian Federation	France
Kyrgyzstan	San Marino	Germany
Moldova	Ukraine	Greece
Montenegro		Hungary
Romania		Iceland
Serbia		Ireland
Tajikistan		Italy
The former Yugoslav Republic of Macedonia		Latvia
Turkmenistan		Lithuania
Uzbekistan		Netherlands
		Norway
		Poland
		Portugal
		Slovakia
		Slovenia
		Spain
		Sweden
		Switzerland
		Turkey
		United Kingdom of Great Britain and Northern Ireland

Table 2. Distribution of countries at different stages of ESD implementation
Source: W. Leal Felho, An overview of ESD in European countries: What is the role of National Governments?, 2010.

Box 1: Whole-schools approach to ESD
A small but growing number of educational institutions are using the innovative 'whole-schools approach to ESD. This involves embedding sustainability at the heart of all a school does. This includes not only a cross-cutting curriculum approach to sustainability, but also values and attitudes associated with sustainability to guide school governance, resource use, school grounds and community engagement. **Ireland's 'Green-Schools'** provides a good example of this approach in action; integrating environmental issues into the day-to-day running of schools.

(From: http://www.se-ed.org.uk/resources/Practice_Barriers_Enablers_Report_Full.pdf)

The integration of environment and development into higher and vocational education has been far patchier and is almost always at the discretion of higher or further educational institutions themselves. In the global North declarations on the importance of environment and development in education have been relatively common, whilst the global South has lagged behind. However, the latest data from the MEEP suggests this is starting to change and some innovative higher education partnerships on ESD have developed.[14]

[14] UNESCO (2009) *Learning for a sustainable world: Review of Contexts and Structures for Education for Sustainable Development*, URL: http://www.uni-graz.at/rce/documents/downloads/UNESCO_DESD_Complete_report_09.pdf

Increasing public awareness

Raising public awareness as part of a global education effort to establish and strengthen attitudes and values that are consistent with sustainable development is taking place at an international, national and local level. A number of international agreements directly pertain to the importance of public awareness of environmental issues and values, including the 1989 Hague Declaration on Tourism which states that countries should promote environmentally sound tourism activities and Article 13 of the Convention on Biodiversity, ratified by 180 countries, which establishes the importance of public awareness of conservation issues. The UNFCCC's five-year New Delhi Work Programme[15] focuses on public awareness, public participation, public access to information and international cooperation in the field of climate change, and The World Summit for Children also emphasised spreading knowledge needed for 'better living' and included this as one of its '27 World Goals for Children'[16].

Alongside international agreements, a wide range of other international initiatives have been created with the explicit aim of increasing public awareness of sustainability. World Environment Day, established by the UN General Assembly prior to Agenda 21, nonetheless acts as an effective vehicle for public awareness raising and political action on the environment.[17] UN agencies also manage a variety of public awareness programmes on specific environmental issues. For instance, through its Climate Change Education for Sustainable Development programme, UNESCO aims to make climate change education a more central and visible part of the international response to climate change. It does this not only through strengthening the capacity of Member States to provide formal climate change education, but also by enhancing non-formal education through working directly with the media. UNEP also works towards this agenda, for instance by supporting the 'Youth Action around the World' network which highlights the work of young activists around the world to inspire environmental values and action.[18]

National governments are also supporting the implementation of Chapter 36 by ensuring public awareness is increased through the provision of ESD in formal education (as described in the previous section), public information and tourism activities, arts and other media and science communication programmes. National public awareness initiatives often have specific target groups in whom they want to promote values in line with sustainability. According to the Mid-Decade report of the MEEG, groups most commonly targeted include the underprivileged, young people, other minority or vulnerable groups and tourists.[19] How these groups are targeted varies country-to-country but common approaches include public information and advertising campaigns. For instance, in Botswana TV advertising is used to promote environmental values and in Cuba two TV channels have been launched with the sole aim of communicating sustainability values.[20] In Europe and North America the use of TV and film is also common, but activities here extend to government sponsored animations and funding for theatre, exhibitions and radio programmes with sustainable development or environmental content and messages.[21]

[15] UNFCCC, New Delhi work programme on Article 6 of the Convention, URL: http://unfccc.int/cooperation_and_support/education_and_outreach/items/2529.php
[16] UNICEF (2002) The World's Goals for Children, URL: http://www.unicef.org/specialsession/about/goals/goals.html
[17] UNEP, World Environment Day: http://www.unep.org/wed/
[18] UNEP, Youth Around the World Network: http://www.unep.org/tunza/youth/

[19] UNESCO (2009) *Learning for a sustainable world: Review of Contexts and Structures for Education for Sustainable Development*, URL: http://www.uni-graz.at/rce/documents/downloads/UNESCO_DESD_Complete_report_09.pdf
[20] ibid
[21] ibid

Box 2: The Swedish approach to public awareness
Sweden has made particular headway in raising public awareness of sustainability. Its campaigns are aimed at informing the public of the links between sustainable development goals and objectives and their own lives. This line of action, pursued by Sweden's 'Ministry of Sustainable Development' (Sweden was the world's first country to have a Cabinet Minister responsible for sustainability issues) represents an inclusive approach whereby citizens from all regions, professions and social backgrounds, can access information on sustainable development issues. Better informed citizens understand relevant market mechanisms more easily and are prepared to pay the costs of measures leading to sustainable development.

(From: http://www.uni-graz.at/rce/documents/downloads/UNESCO_DESD_Complete_report_09.pdf)

Box 3: The role of NGOs and indigenous groups
NGOs play a crucial role in raising public awareness of environment and development issues, and are often particularly well-placed to work with vulnerable groups in establishing sustainable values and behaviour. In 2005, a local NGO worked with Mayangna leaders in Central America and UNESCO's Local and Indigenous Knowledge Systems (LINKS) to launch a project to record and safeguard Mayangna knowledge and worldviews. The communities chose to focus the first phase of work on fish and turtles, which are their primary source of protein and a vital part of the Mayangna way of life. After extensive community-level consultations, the LINKS Programme launched a publication that captures the breadth and depth of indigenous knowledge about the aquatic world, weaving empirical observations on behaviour, habitat, reproduction and migration patterns, with social commentaries on sharing, learning and harvesting. The publication provides a foundation for enhancing biodiversity management by bringing indigenous knowledge on board alongside science.

(From: http://www.uni-graz.at/rce/documents/downloads/UNESCO_DESD_Complete_report_09.pdf)

It is difficult to measure the extent to which any of the above national and international initiatives have helped implement increased public awareness. The promotion of ESD as part of public awareness campaigns and activities is by nature less unstructured than formal education interventions. Such activities are also more difficult to control or manage, often relying as they do on networks, campaign days and advertising.[22] This has consequences for determining whether activities are effective and efficient. So whilst it is possible to observe that the implementation of public awareness raising activities are taking place, it is almost impossible to measure the extent to which these activities are directly and successfully changing values and attitudes.

Training
Training was also stressed in Chapter 36. In order to secure a more sustainable world, environmentally literate, aware and skilled citizenry and workforces are needed to help guide nations in implementing their sustainability plans. The types of training that are specified in chapter 36 can be broadly split into three areas: training in the education sector that aims to support the reorientation of formal and informal education towards sustainability; training provided to encourage broader value change in line with sustainability by targeting specific groups including young people, media and leaders in business and government; and training designed to help deliver green jobs and a green economy.

UNESCO has identified the professional development of teachers in ESD as 'the priority of priorities' because there is a long way to go until it is widespread.[23] A number of studies and

[22] ibid
[23] UNESCO (2010) *Strategy for the Second Half of the United Nations Decade of Education for Sustainable Development*, URL: http://www.preventionweb.net/files/15341_unescostrategyfortheunitednationsde.pdf

reports stress that teachers lack support in addressing complex challenges of climate change in a holistic and interdisciplinary manner.[24] So there is a clear need for systematic teacher education programmes that are not restricted to a single discipline. International support to this end is being provided, for instance through UNESCO training materials such as their 'ESD Toolkit for Teachers' and through UNEP's Environmental Education and Training Unit.[25]

There has been a particular focus on providing training directly to local communities. For instance, the UN University has developed the Regional Centres of Expertise (RCE) that deliver ESD to local communities all over the world.[26] In line with recommendations in Chapter 36, UN aid programmes have also incorporated ESD in local work. For instance, the UNDP has regional ESD teams that support policy-makers and communities to develop in a sustainable way.

There has been a particular push on providing professional training to the media on sustainability and environmental issues as media reporting of sustainability has been less than satisfactory since Agenda 21. Training initiatives are being delivered through a range of organisations and agencies. Internationally, UNESCO has coordinated training for media in developing countries. For instance, it recently ran a workshop on reporting of sustainability in Lesotho aimed at training local and community media.[27] Higher education institutions have also played a role in training media by coordinating media and academia networks on these issues and providing specific workshops. The London School of Economics (LSE) held a series of workshops on reporting environmental issues specifically targeted at media workers during its 2010 'Sustainability in Practice' programme.[28] Perhaps most significant though, is the work of the multi-stakeholder institution the Global Reporting Initiative (GRI) which is currently working with global media outlets including broadsheet press to develop the first ever set of global sustainability reporting guidelines for the media sector.[29]

Workforce training is explicitly referenced in Chapter 36 and is seen as a key part of implementing Agenda 21. However, if anything, the workforce skills and training agenda has become the *most* significant contribution education can make to achieving a more sustainable world and in particular enabling the transition to a green economy. Workforce training for green jobs has received significant international support including from the IPCC which estimated that upwards of 1 million new jobs would need to be created and training provided as part of the transition to a green economy.[30] Recent initiatives around green economy have mentioned the importance of training e.g. the Climate Investment Funds are targeting and supporting low carbon development pathways (including training) in low income countries.[31] Investment in training for a transition to a green economy is also taking place through national governments to varying degrees.

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[24] See: Z. Robinson, *Teaching Climate Change in Higher Education: Barriers and Opportunities*, Keele University and (UNESCO, *Teacher Training is in its infancy*: http://www.unesco.org/new/en/education/resources/online-materials/single-view/news/teacher_training_in_climate_change_education_is_in_its_infancy/

[25] R. McKeown (2002) *Education for Sustainable Development Toolkit*, UNESCO, URL: http://www.esdtoolkit.org/

[26] UN University Regional Centres of Expertise: http://www.ias.unu.edu/sub_page.aspx?catID=108&ddlID=183

[27] Jennings, V., and Bird, E. (2008) *Media as partners in education for sustainable development*, UNESCO, URL: http://unesdoc.unesco.org/images/0015/001587/158787E.pdf

[28] London School of Economics, Sustainability in Practice lectures 2009 - 2010: http://www2.lse.ac.uk/intranet/LSEServices/estatesDivision/sustainableLSE/policyObjectives/educationForSD/TrainingGuidance.aspx

[29] Global Reporting Initiative, sustainability reporting guidelines for the media sector consultation: http://www.globalreporting.org/ReportingFramework/SectorSupplements/Media/Media.htm

[30] Intergovernmental Panel on Climate Change (2007) *Climate Change 2007 Synthesis Report*, URL: http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_synthesis_report.htm

[31] Climate Investment Funds: http://www.climateinvestmentfunds.org/cif/

Challenges and Conflicts

Defining ESD

Like sustainable development itself, education for sustainable development has suffered from a lack of clarity about meaning. As UNESCO - the Task Manager for the implementation of Chapter 36 - has noted, there is no 'one size fits all' approach to incorporating ESD into formal and informal education systems.[32] The UNESCO-UNEVOC International Centre recently reported that there is little understanding of what ESD means amongst vocational educators and that definitions range from '*single issues relating to environment, to economic and cultural concerns, with some being closer to the universal conceptions of sustainable development*.'[33] Whilst this does not necessarily mean that ESD is a weak concept, in fact as the 2009 review of the DESD notes, its flexibility allows it to be approached from different vantage points and in local and global ways, there is little doubt that greater understanding of what ESD is and looks like would promote the implementation of Chapter 36.[34] UNESCO is moving forward on this, providing toolkits and best practice examples of what regional, national and local implementation looks like.

Attempting to find common language for ESD has also highlighted geographical differences in approaches to Chapter 36. As noted by Ros Wade, Chapter 36 attempted to bring the two existing constituencies of environmental education and development education together by brokering the new concept of education for sustainable development.[35] Wade argues that the separation between these two ideas has its roots in Western culture, which can have the consequence of making the ESD process less relevant for the global South.[36] Indeed, in many Southern countries, environment and development issues are already highly connected and are not regarded as separate constituencies. Using South Africa as an example, Lotz-Sisitka has pointed out that, '*environmental education is strongly focused on the social, political, economic and biophysical dimensions*'.[37]

The role of educationalists

The role of educationalists with regard to the implementation of ESD has also proved a challenge in some respects. In contrast to many education movements, the drive for formal and informal education to be reoriented towards sustainable development was initiated by groups outside of the education community. The major push for ESD in the 1990s, described at the beginning of this paper, was initiated by the international community at the World Conference for Education for All in Jomtien and at the Earth Summit which gave rise to Agenda 21. In many countries, ESD is still being shaped by those outside the education community. The concepts and content of ESD in these cases are developed by ministries, such as those of environment and health, and then given to educators to deliver.[38] This separation between the international community and educationalists has been compounded by frustration that education is not a major group (MG) of civil society in the Commission for Sustainable Development (CSD) processes. For Chapter 36 and ESD to be

[32] UNESCO Bangkok, Education for Sustainable Development Unit, *Good Practice Examples of ESD*, URL: http://www.unescobkk.org/education/esd-unit/good-practice/
[33] UNEVOC (2010) Integrating Sustainable Development in Technical and Vocational Education and Training, URL: http://unesdoc.unesco.org/images/0019/001906/190635e.pdf
[34] UNESCO (2009) *Learning for a sustainable world: Review of Contexts and Structures for Education for Sustainable Development*, URL: http://www.uni-graz.at/rce/documents/downloads/UNESCO_DESD_Complete_report_09.pdf
[35] R. Wade (2008) *Education for sustainability: challenges and opportunities*, Policy and Practice, URL: http://www.developmenteducationreview.com/issue6-focus3
[36] ibid
[37] *Lotz-Sisitka*, H. *2004.* Guest Editorial: *Stories of Transformation*. International Journal of Sustainability in Higher Education. 5(1), 8-11
[38] R. McKeown (2002) *Education for Sustainable Development Toolkit*, UNESCO, URL: http://www.esdtoolkit.org/

successfully implemented, they must have the full support and involvement of educators who are charged with delivering it.

Resource allocation

One of the most significant challenges to successfully reorienting education towards sustainable development is a lack of funding. The effective allocation of resources is noted as a challenge to implementation in UNESCO's 'Strategy for the Second Half of the United Nations Decade of Education for Sustainable Development'[39] and the 'Education for Sustainable Development Toolkit' notes that one of the major constraints for Chapter 36 has been that few financial resources have been dedicated to ESD[40]. This does not mean that funding for education per se is problematic. In fact, most countries spent a larger percentage of their gross national product (GNP) on education in the 2000s than the 1990s.[41] But at both national and local levels, little of this has been spent on the aims of Chapter 36 beyond improving basic education. This is only likely to worsen as global economic problems increasing domestic spending on education and affect aid flows. Indeed, as Tilbury has argued, since the economic downturn, new funding priorities are threatening the process of mapping the progress made in implementing education for sustainable development.[42]

The provision of financial resources for ESD should not be left to governments alone. Multilateral and bilateral donors and the private sector have the potential to be important contributors. To gain the full support of donors and stakeholders, ESD needs to be not only included on the national agenda, but also to be incorporated into budgeting frameworks, national development plans and national sustainable development strategies (if available).

Partnership working and inter-agency cooperation

UNESCO was appointed the 'Task Manager' for the implementation of Chapter 36 and as such has taken the lead in coordinating UN efforts to support and promote all three programme areas at international, national and local levels. As discussed in this review, other UN agencies have also contributed to the implementation of Chapter 36, including UNDP through its regional ESD teams, UNEP via its Training Unit and the UNFCCC through its focus on 'public awareness' in the New Delhi Work Programme. However, as noted in the 2009 review of the Decade of Education for Sustainable Development (DESD) the UN contribution to the DESD and to the implementation of Chapter 36 cannot yet be characterised as 'one concerted UN response.'[43]

Media reporting of sustainability issues

Public awareness of sustainable development and environment issues is still minimal and confused. In part this can be attributed to media coverage of sustainability. Environmental matters – particularly climate change - continues to get press coverage, but media reporting of sustainable development's triple bottom line agenda (economic, social and environmental values) is sporadic, even non-existent.[44] Ecological disasters and pollution incidents are more likely to garner press

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[39] UNESCO (2010) *Strategy for the Second Half of the United Nations Decade of Education for Sustainable Development,* URL: http://www.preventionweb.net/files/15341_unescostrategyfortheunitednationsde.pdf

[40] R. McKeown (2002) *Education for Sustainable Development Toolkit*, UNESCO, URL: http://www.esdtoolkit.org/

[41] UNESCO (2000) *World Education Report: the right to education,* URL: http://www.unesco.org/education/information/wer/

[42] D. Tilbury (2010) *Are we Learning to Change? Mapping Global Progress in Education for Sustainable Development in the Lead Up to 'Rio Plus 20'*, University of Gloucestershire, URL: http://insight.glos.ac.uk/sustainability/news/Documents/Are%20We%20Learning%20to%20Change%20Mapping%20Global%20Progress%20in%20ESD%20%20in%20the%20Lead%20Up%20to%20Rio%20Plus%2020%20D%20Tilbury.pdf

[43] UNESCO (2009) *Learning for a sustainable world: Review of Contexts and Structures for Education for Sustainable Development,* URL: http://www.uni-graz.at/rce/documents/downloads/UNESCO_DESD_Complete_report_09.pdf

[44] *Voisey*, H., *Church*, C.. *1999*. PA-*1999*-02 : Who's Listening To You? Media Coverage of Sustainable Development and Local Agenda 21 Download: *pa_1999_02*.pdf

coverage than underlying social and economic problems and their causes. This poses a special problem for those working on issues relating to Agenda 21 and in particular Chapter 36 which aims to promote sustainable development as a cross-cutting issue. As captured earlier in this paper, various initiatives exist to better educate journalists about sustainability issues and the Global Reporting Initiative is currently developing reporting guidelines with journalists. Nonetheless, ensuring that sustainability is communicated in an accurate and consistent manner to the public remains a challenge in delivering Chapter 36 and in particular the 'public awareness' programme area. The needs of those working in the media regarding information on sustainable development issues are still, to a great extent, not known, particularly as they differ considerably from country to country.[45]

Government policy

The incorporation of ESD into informal and particularly formal education is often subject to the whims of national government and teaching staff. As noted earlier in this paper, reorienting national education strategies towards sustainable development has been relatively successful in the sense that ESD has been incorporated into most countries policy documents or constitutions. However, the teaching of sustainability and environmental issues within schools is often left to the discretion of school leaders and teachers, which leads to significant differences in the way sustainability is taught school-to-school. Compounding this, the presence of environmental issues in school curriculum can be approached as a political issue by some governments. For instance, in the UK the government's national curriculum adviser has recently recommended that climate change and other topical scientific issues should not be included in the UK national curriculum but should instead be taught at the discretion of school leadership. Climate change has featured in the UK national curriculum since 1995 and in 2007, the topics 'cultural understanding of science' and 'applications and implications of science' were added to the curriculum for 11- to 14-year-olds.[46] The ability of national government to retrench on the place of sustainability and environment in schools is a serious threat to mainstreaming ESD.

Way Forward

A number of recommendations for more effective implementation of the programme areas of Chapter 36 are made by UNESCO in its report into the first two years of the Decade for Education for Sustainable Development. These include support for greater resource utilisation; using its capacity for advocacy at the international level, UNESCO and sister agencies of the UN family should use relevant mechanisms to mobilise financial support for the DESD for countries that need it most.[47] Mechanisms such as the High Level Panel on DESD should be fully utilised to encourage greater global financial support for ESD. Partnership working also needs to improve in global and national arenas: UN agencies need to work more closely to deliver a 'one UN' response to the challenges of Chapter 36, and national governments must increase inter-departmental working. A structure for interdepartmental governmental cooperation on ESD is still lacking as there is little experience in cross-boundary thinking among policy-makers and governmental departmental structures.[48]

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[45] International Federation of Environmental Journalists Congress: http://www.cmsvatavaran.org/vatavaran2005/ifejcongress.pdf
[46] *Climate change should be excluded from the curriculum*, The Guardian Newspaper, 12 June 2011: http://www.guardian.co.uk/education/2011/jun/12/climate-change-curriculum-government-adviser
[47] UNESCO (2009) *Learning for a sustainable world: Review of Contexts and Structures for Education for Sustainable Development*, URL: http://www.uni-graz.at/rce/documents/downloads/UNESCO_DESD_Complete_report_09.pdf
[48] UNESCO (2009) *Learning for a sustainable world: Review of Contexts and Structures for Education for Sustainable Development*, URL: http://www.uni-graz.at/rce/documents/downloads/UNESCO_DESD_Complete_report_09.pdf

The role of the education community must also be revisited. There remains a sense that the goals of Chapter 36 are driven by stakeholders working in sustainability and environment rather than education. Maurice Strong has spoken publicly about his regret at not engaging the global education community in the Agenda 21 process.[49] During the second half of the DESD, it is crucial that the education community are empowered to be partners in delivering the programme areas of Chapter 36. The UN Non-Governmental Liaison Service (NGLS) identified a number of ways to achieve greater mobilisation of the education community in its consultation of civil society for the High-Level panel on Global Sustainability, including the creation of inter-agency, civil society-driven leadership mechanisms for the delivery of reorientation of education towards sustainability.[50]

Finally, the approach to implementing Chapter 36 must be responsive to new global economic and social conditions. In particular, the global financial crisis has provided an opportunity to ask questions about the purposes of education and training and in particular what kind of society and economy education should be preparing both young people and adults for. These questions have always shaped discussions about education for sustainable development but they have now acquired a new urgency.[51] This was captured by the UNESCO World Conference on Education for Sustainable Development held in Bonn, Germany, from 31 March to 2 April 2009, with the Bonn

Declaration stating, '*investment in education for sustainable development (ESD) is an investment in the future*'. Chapter 36 must be reconceptualised as a means of supporting the global transition to sustainable development.[52] There is scope for millions of jobs to be created globally as part of this transition and the education and training programme areas of Chapter 36 could and should be key tools for promoting and delivering them. The single most important way forward for Chapter 36 is to understand and incorporate contemporary economic and social challenges, and re-orientate its language and activities in education and training towards the transition to sustainable development.

[49] UN Non-Governmental Liaison Service, Civil Society Consultation on the High-level Panel on Global Sustainability, URL: http://www.un-ngls.org/spip.php?page=agsp&id_article=3332
[50] ibid
[51] UNESCO (2010) *Strategy for the Second Half of the United Nations Decade of Education for Sustainable Development,* URL: http://www.preventionweb.net/files/15341_unescostrategyfortheunitednationsde.pdf
[52] UNESCO (2009) Bonn Declaration: http://www.esd-world-conference-2009.org/fileadmin/download/ESD2009_BonnDeclaration080409.pdf

Chapter 37: National Mechanisms & International Cooperation for Capacity-Building in Developing Countries

Introduction

At the Rio Summit it was recognized that building a country's capacity:

> *'…encompasses the country's human, scientific, technological, organizational, institutional, and resource capabilities. A fundamental goal of capacity-building is to enhance the ability to evaluate and address the crucial questions related to policy choices and modes of implementation among development options, based on an understanding of environmental potentials and limits and of needs as perceived by the people of the country concerned'.*[1]

Chapter 37 of Agenda 21[2] encourages the integration of environmental and developmental concerns through ongoing participatory processes that identify areas where capacity building and the strengthening of human resources and institutional capabilities is needed, and through international cooperation to build that capacity through know-how, technology transfers, streamlined policies and financial aid.[3]

Implementation

National Strategies

Major global conferences and summits over the last two decades have called on countries to prepare and implement National Strategies for Sustainable Development (NSSDs), including the United Nations Conference on Environment and Development (UNCED) in 1992, and the five-year review of UNCED (Rio+5) in 1997. The World Summit on Sustainable Development (WSSD) in 2002 set the target for countries to take immediate steps to advance the development of NSSDs and begin their implementation by 2005.[4] Within this context, Agenda 21 reiterated the call for NSSDs that harmonize the various sectors involved in achieving sustainable development – economic, social, political and environmental. Within the Millennium Declaration (2000) and the subsequent Millennium Development Goals (MDGs) countries were once again encouraged to ensure their development. Further to this, the 2005 World Summit resolution calls for the adoption by 2006, and the implementation of comprehensive national development strategies to achieve the internationally agreed development goals and objectives, such as the MDGs.[5]

NSSDs should define the process by which countries commit to meeting sustainable development targets or Agenda 21 at the national level and should not require a completely new planning

[1] US AID (2010) Global Climate Change: Capacity Building. URL: http://www.usaid.gov/our_work/environment/climate/policies_prog/capacity.html [accessed 03.07.2011]
[2] UNDESA Division for Sustainable Development (1992) Chapter 37: National Mechanisms and International Cooperation for Capacity Building in Developing Countries URL: http://www.un.org/esa/dsd/agenda21/res_agenda21_37.shtml
[3] Biopolitics International Organisation via Proudcities Project on Capacity Building for Sustainable Development
[4] UNECA (2011) National Strategies for Sustainable Development: A Sixteen Country Assessment http://www.uneca.org/eca_programmes/sdd/events/Rio20/Workshop-Institutional-StrategicFrameworks/NatlStratsForSustDev_color_FIN1.pdf
[5] UNECA (2011) National Strategies for Sustainable Development: A Sixteen Country Assessment http://www.uneca.org/eca_programmes/sdd/events/Rio20/Workshop-Institutional-StrategicFrameworks/NatlStratsForSustDev_color_FIN1.pdf p.1

process but rather a reorientation of existing activities.[6] An individual country may have a range of initiatives and strategies - for example, Poverty Reduction Strategy Papers, Comprehensive Development Frameworks, Vision 20:20 – in response to international commitments or agreements, and these strategies may contribute to or even individually reflect what is considered an NSSD.[7] Both the Organization for Economic Cooperation and Development/Development Assistance Committee (OECD/DAC) and the United Nations Commission on Sustainable Development (UNCSD) guidelines on the NSSD process state that a NSSD does not necessarily mean developing a new strategy document, but it should entail improving or restructuring the decision-making process to achieve a full integration of social and environmental issues and a broader range of public participation.[8]

In many of the Least Developed Countries (LDCs), the focus has been on poverty reduction strategies (PRSs)[9] which tend to pay more attention to development aspects rather than integration with environmental concerns. In such instances the imperative is to build upon PRSs by harmonising their objectives with sustainable development aims; the Johannesburg Plan of Implementation (JPOI), for example, recommended that where applicable, NSSDs could be formulated as PRSs that integrate economic, social and environmental aspects of sustainable development[10]. The approach sought to empower governments to set their development priorities and to specify policies, programmes and resources needed to meet their goals. It was hoped that this process could help crystallize political commitment and accountability - both for countries themselves and for their development partners - for accelerating progress towards MDGs. Core PRS principles are; (i) Country-driven with broad based participation, (2) Medium to long-term in perspective, (3) Comprehensive and results oriented, and (4) Partnership-oriented[11]. By September 2005, 49 countries had prepared national PRS. Just over half of those countries were in sub-Saharan Africa (SSA); a similar proportion comprised Heavily-Indebted Poor Countries (HIPC). Countries had been implementing their strategies, on average, for just two and a half years[12].

PRSs and, more broadly, the NSSDs are becoming the framework through which national leadership over development priorities is exercised and implemented[13]. They also provide an opportunity for identifying and highlighting areas of national weakness where capacity and capability building would be fruitful. The United Nations Regional Economic Commission for Africa (UNECA) conducted a study in 2006 on the state of NSSD implementation in 16 countries in Africa and the needs highlighted through the process. South Africa's Draft NSSD revealed that the country was concerned with building capacity for sustainable development, particularly in terms of integrating environment and natural resources management concerns in curricula, building the capacity of local government to improve service delivery, and for sustainable local-level planning, and putting in place a coherent and clearly identified sustainability Research and

[6] Earth Summit 2002 "What are National Strategies for Sustainable Development?" http://www.earthsummit2002.org/es/national-resources/about_nssd.html
[7] Ibid.
[8] UNECA (2011) National Strategies for Sustainable Development: A Sixteen Country Assessment http://www.uneca.org/eca_programmes/sdd/events/Rio20/Workshop-Institutional-StrategicFrameworks/NatlStratsForSustDev_color_FIN1.pdf p.7
[9] PRSs discussed here are not limited to PRSPs prepared under the HIPC Initiative of the World Bank and the IMF. They include all other strategies and initiatives aimed at reducing poverty being developed and implemented by countries.
[10] UNECA (2011) National Strategies for Sustainable Development: A Sixteen Country Assessment http://www.uneca.org/eca_programmes/sdd/events/Rio20/Workshop-Institutional-StrategicFrameworks/NatlStratsForSustDev_color_FIN1.pdf p.27
[11] Ibid.
[12] Ibid. p.30
[13] UNDP (2008) Response to changing aid environment; URL: http://www.beta.undp.org/content/dam/aplaws/publication/en/publications/capacity-development/undg-response-to-the-changing-aid-environment/UNDG---Response-to-the-Changing-Aid-Environment.pdf

Development (R&D) programme. Similarly, capacity strengthening featured prominently among the needs expressed, with 60, 50 and 40 per cent of countries articulating the need for financial, technical and institutional capacities, respectively. Lack of capacity remains a major constraint to reaching the MDGs and to reducing poverty.[14]

International Capacity Building Programmes

International cooperation and participation is increasingly being recognised as vitally important in assisting developing countries to build the necessary capacity to achieve their sustainable development aspirations and MDGs.[15] This was heavily emphasised at the WSSD in 2002 and since then, capacity building has become a core goal of technical assistance provided by the United Nations (UN) system and other bodies working together towards the same goals.[16]

One manifestation of this was the launch of Capacity 21 by the UNDP at the 1992 Earth Summit, which provided a unique type of assistance for capacity building and allowed programmes to be country-owned and country-driven.[17] The subsequent programme – Capacity 2015 – built on the successes of Capacity 21,[18] and the more recent UNDP Strategic Plan (2008-2013) positions capacity development as the organisation's core contribution to development.[19]

International organisations are also striving to put capacity building at the centre of their activities. USAID has placed the building of human and institutional capacity to address climate change as a fundamental component of their three-pillared approach, which encompasses adaptation, clean energy, and sustainable landscapes. Examples include USAID-sponsored workshops, training seminars, and technical assistance activities in over 40 countries.[20] Likewise, the International Development Research Centre (IDRC) has strived for over 30 years towards achieving sustainable and equitable development through equipping people in developing countries with the tools for change including technologies, new sources of information, and ways to build capacity in attempts to reach the ambitions of Agenda 21.[21]

The World Bank's (WB) traditional efforts in building public sector capacity focused primarily on creating or reorganizing government units and building individual skills. Over the last 10 years it has begun to focus on the need to improve the strength of the public sector including the strengthening of public institutions and fostering of demand for public service improvements. It has added new diagnostic tools to assess countries' capacities to manage their public financial resources and has increased the range of lending instruments for delivering its capacity building support to increase country ownership of these activities. It has also expanded corporate and Regional programs directly supportive of capacity building.[22] Since 2008 the WB has also

[14] UNECA (2011) National Strategies for Sustainable Development: A Sixteen Country Assessment http://www.uneca.org/eca_programmes/sdd/events/Rio20/Workshop-Institutional-StrategicFrameworks/NatlStratsForSustDev_color_FIN1.pdf p.44

[15] UNEP (2002) Capacity Building for Sustainable Development: An overview of UNEP environmental capacity development activities, p.6 URL: http://www.unep.org/Pdf/Capacity_building.pdf

[16] Ibid. p.10

[17] UNEP (2002) Capacity Building for Sustainable Development: An overview of UNEP environmental capacity development activities, p.10 URL: http://www.unep.org/Pdf/Capacity_building.pdf

[18] UNDP (2005) Capacity 2015 Africa Local Level Integrated Information Systems Brief, URL: http://www.beta.undp.org/undp/en/home/librarypage/capacity-building/capacity-2015-africa-local-level-integrated-information-systems.html

[19] UNDP (2011) Capacity Development: Our Approach URL: http://www.beta.undp.org/undp/en/home/ourwork/capacitybuilding/approach.html [accessed 03.07.2011]

[20] US AID (2010) Global Climate Change: Capacity Building. URL: http://www.usaid.gov/our_work/environment/climate/policies_prog/capacity.html [accessed 03.07.2011]

[21] IDRC (2003) Making Change Happen: Means of Implementation (Agenda 21, Section 4) http://www.idrc.org.sg/eepsea/ev-27421-201-1-DO_TOPIC.html [accessed 03.07.2011]

[22] http://lnweb90.worldbank.org/oed/oeddoclib.nsf/24cc3bb1f94ae11c85256808006a0046/5676a297fe57caf685256fdd00692e32/$FILE/africa_capacity_building.pdf p.vii

developed the Capacity Development Results Framework (CDRF), which addresses the current issues in capacity building such as fragmented approaches, lack of consensus, lack of grounding in theory, failure to build monitoring procedures, and other issues related to streamlining capacity building. The Framework and associated standardized indicators promise of raising the effectiveness of resources devoted to capacity development by revealing clearly what works and what does not.[23]

The Agreement under the United Nations Framework Convention on Climate Change (UNFCCC) has long recognized the need to assist Parties - particularly developing countries - in their responses to climate change and has addressed this through technology transfer, funding and national communication.[24] The UNFCCC sees capacity building as essential for climate change action through strengthening support for enhanced institutions, communication, education, training, and strengthened networks, through the allocation of financial resources toward capacity building.[25] Thus, the theme of capacity building embodied in the various UN organisations and international agreements such as Agenda 21 and the MDGs passes on the responsibility to Member States as well.

National governments have also taken steps to encourage capacity building and the incorporation of environmental dimensions into their socio-economic policies for sustainable development. In Africa, for example, actions include the merging of the Ministries of Environment with the Ministries of Economic Planning, and the stationing of environmental experts in other crucial ministries, such as for agriculture, industry, and transport. Alongside this, some African countries have institutionalized mechanisms for the empowerment and involvement of marginalised sections of communities by enhancing local capacity building within the formulation and implementation of environmental policies.[26]

Harmonization of the delivery of assistance at the regional level

Agenda 21 aimed to harmonise capacity development efforts at the regional level through improved regional and subregional consultative processes and the establishment of regional steering mechanisms, and highlighted the potential role of the UNDP in implementing such measures.[27] UNDP support to Africa at the regional level from 2002 to 2007 was central to initial capacity development initiatives in the region, with the capacity of African states to participate in international trade negotiations and MDG-based planning particularly strengthened.[28] However, the consideration of cross-cutting themes such as the environment was limited, leading to a lack of harmonisation of interventions across the region.[29] The long-term sustainability of capacity development interventions was also found to be lacking, with a degree of dependency on UNDP institutions observed in many cases.[30] UNDP work in Asia and the Pacific over the same period led to a cohesive regional Strategy for the implementation of the Millennium Development Goals

[23] World Bank and World Bank Institute (2009) The Capacity Development Results Framework: A strategic and results oriented approach to learning for capacity development, p.2
http://siteresources.worldbank.org/EXTCDRC/Resources/CDRF_Paper.pdf?resourceurlname=CDRF_Paper.pdf
[24] Climatico (Feb 2011) Cancun Debriefing: An Analysis of the Cancun Agreement URL: http://www.climaticoanalysis.org/wp-content/uploads/2011/02/Canc%C3%BAn-De-briefing.pdf [accessed 03.07.2011]
[25] Ibid.
[26] UNECA (2001) Review and Appraisal of the Implementation of Agenda 21 in Africa. Second meeting of the Committee on Sustainable Development, Addis Ababa, Ethiopia, Nov 2001. URL: http://www.uneca.org/csd/csd2_agenda21.htm
[27] http://www.un.org/esa/dsd/agenda21/res_agenda21_37.shtml
[28] UNDP (2007), UNDP Regional Programme Document for Africa (2008-2011), p. 2. URL: http://www.undp.org/africa/programme.shtml
[29] Ibid.
[30] Ibid.

and poverty reduction, but it is less clear that environmental themes were given consideration, and efforts to harmonise monitoring and evaluation across the region were limited.[31]

Capacity development through knowledge sharing has also become a key tenet of UNDP strategy in the region over the last few years, an important example being the Solutions Exchange project which has succeeded in linking nearly 30,000 practitioners across the region.[32] In Latin America and the Carribean, meanwhile, UNDP work has recently focused upon strengthening capacity to improve development aid coordination through a series of sub-regional workshops on aid effectiveness.[33]

The Paris Declaration on aid effectiveness, adopted in 2005, enables aid recipients to forge their own National Development Plans.[34] The declaration urges developing countries to make capacity development a key goal of their national development strategies.[35] The Accra Agenda for Action (AAA) in 2008 aimed to strengthen and deepen the impact of the Paris Declaration and set an agenda for stronger ownership, inclusive partnership and delivering of results, and capacity building.[36]

There has been an increase in international bodies working together to achieve sustainable development in this way. Under the UNFCCC, the Nairobi Work Programme (NWP) was established to assist all Parties, in particular developing countries, including the least developed countries and small island developing States to improve their understanding and assessment of impacts, vulnerability and adaptation to climate change and to make informed decisions on practical adaptation actions and measures to respond to climate change on sound scientific, technical and socio-economic basis, taking into account current and future climate change and variability.[37] UNEP and the United Nations Conference on Trade and Development (UNCTAD) launched the UNEP-UNCTAD Capacity Building Task Force on Trade, Environment and Development to strengthen the capacities of developing countries and countries with economies in transition to address issues related to trade, environment and development.[38]

Regionally, cooperation is also growing. For example, the Economic Commission for Africa (ECA) has played a catalytic role in the implementation of Agenda 21. ECA through advisory services helped African countries to set up national sustainable development committees to enhance political awareness through workshops and seminars.[39] In some countries in Africa, councils of NGOs have been established with their own mandate of enhancing the capacities of local authorities through localised Agenda 21 plans of action.[40]

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[31] UNDP (2007), UNDP Regional Programme for Asia and the Pacific (2008-2011), p. 3. URL: http://asia-pacific.undp.org/ourwork/documents/AsiaPacificRPD2008-2011.pdf
[32] Ibid. p. 24
[33] UNDP (2010), Capacity Development Latin America and the Caribbean: Annual Report 2010, p. 14, http://www.regionalcentrelac-undp.org/images/stories/capacity/annualreport2010ingles.pdf
[34] OECD Development Cooperation Directorate http://www.oecd.org/document/18/0,3343,en_2649_3236398_35401554_1_1_1_1,00.html
[35] World Bank and World Bank Institute (2009) The Capacity Development Results Framework: A strategic and results oriented approach to learning for capacity development, p.1 http://siteresources.worldbank.org/EXTCDRC/Resources/CDRF_Paper.pdf?resourceurlname=CDRF_Paper.pdf
[36] OECD Development Cooperation Directorate http://www.oecd.org/document/18/0,3343,en_2649_3236398_35401554_1_1_1_1,00.html
[37] http://unfccc.int/adaptation/nairobi_work_programme/items/3633.php
[38] UNEP (2002) Capacity Building for Sustainable Development: An overview of UNEP environmental capacity development activities, p.6 URL: http://www.unep.org/Pdf/Capacity_building.pdf
[39] UNECA (2001) Review and Appraisal of the Implementation of Agenda 21 in Africa. Second meeting of the Committee on Sustainable Development, Addis Ababa, Ethiopia, Nov 2001. URL: http://www.uneca.org/csd/csd2_agenda21.htm
[40] Ibid.

Challenges and Conflicts

Incremental Change vs. Results

Currently, there is a feeling of disconnect between donors and their aims, and what occurs practically in the field. The UNDP has noted that assistance is often implemented quickly with the easiest solution taken impeding a more systematic focus on capacity development. However, the UNDP also noted that while this has significant negative impacts on the recipient country, they recipient countries themselves are not always clear on their capacity development needs and do not systematically articulate strategies to address them. Thus this communication failure is leading to bottlenecks in the efficiency of capacity building initiatives from both sides.[41] There is a perception among a number of organisations that current approaches to results-based capacity development can become a 'straightjacket'. Aid agencies tend to focus on implementation around interventions that stress pre-defined, measurable outputs and indicators – often at the level of what the agencies themselves provide.[42] There is growing recognition that capacity development requires more flexible and iterative approaches with greater emphasis given to the way change is supported rather than directly on what measurable change has been achieved, thus there is the challenge of finding a way in which to define and measure capacity building results that take into account this more subtle and iterative element of sustainable capacity building and to avoid what the OECD has referred to as 'Obsessive Measurement Disorder'.[43]

Ghana, in its Poverty Reduction Strategy (PRS) evaluation for 2002-2004 found issues with exactly this and the short term nature of PRS process due to the programmatic requirements of the World Bank and IMF sponsored PRSPs. Furthermore it noted that the level, scope and quality of participation had been low, as it was constrained by the following factors: (a) dominance of public agencies in participatory processes, (b) inadequate time for stakeholders to prepare for participation in forums held to elicit their support, (c) inability to completely or affectively implement outcomes of consultative processes to assure effective and continuous participation, (d) the use of methods of multi-stakeholder processes, such as 'brainstorming' that have limitations in ensuring total participation, (e) lack of timely and equitable access to advance information, education and communication on the processes, objectives, methodology and expected outcomes of consultations by all potential participants.[44] In line with Ghana's experience, a common complaint of assistance projects is that they are too often short-term, output-driven and dependent on outside expertise. The challenge for donor agencies and countries is to evolve their support to recognise that successful sustainable development projects often need long-term investment where the outputs are not always immediately apparent.[45] This is an important need expressed by Ghana related to putting in place an overarching long-term development framework which would help situate the country's NSSD within a long-term, shared strategic and pragmatic vision, which would take into account intergenerational equity issues.[46]

By focusing on achieving measurable results, the projects being implemented are usually not those that lead to longer term sustainable capacity building within the country of implementation.

[41] UNDP (2008) Aid Effectiveness Capacity Development Compendium; URL: http://www.beta.undp.org/undp/en/home/librarypage/capacity-building/undp-aid-effectiveness-capacity-development-compendium.html
[42] OECD (2011) Capacity Development: Lessons Learned and Actions for Busan and Beyond, Synthesis Report, Draft for Discussion at the Cairo Workshop on Capacity Development, p.14. URL: http://www.oecd.org/dataoecd/42/61/48146228.pdf
[43] Ibid.
[44] UNDSD (2005) Expert Group Meeting on Reviewing National Sustainable Development Strategies, New York http://www.un.org/esa/sustdev/natlinfo/nsds/egm/crp_6.pdf
[45] UNEP (2002) Capacity Building for Sustainable Development: An overview of UNEP environmental capacity development activities, p.24 URL: http://www.unep.org/Pdf/Capacity_building.pdf
[46] UNECA (2011) National Strategies for Sustainable Development: A Sixteen Country Assessment http://www.uneca.org/sdd/documents/NatlStratsForSustDev.pdf p.44

Yet, development agencies are caught in an increasing quandary. On the one hand they are working towards goals that require longer term less tangible efforts and results and on the other the funding they are receiving is being increasingly scrutinised by the public of the donor nation. This has really been brought to the fore with the consequences of the financial crisis and the fact that many members of the public, especially in the UK, for example, believe the money spent on international development by the UK government, should be spent within their home country. Thus the UK government is consistently pushing donor agencies to ensure results are provided in order to appease the public.[47]

Country-Driven Approaches

The above discussion on results and short term oriented approaches to capacity building has also led to issues regarding the endogenous nature of capacity building within recipient countries. Capacity development involves much more than skills transfer alone. It is first and foremost about endogenous change to build the individual skills and collective institutional capabilities needed to achieve national goals and to contribute to changing social values. Country leadership to create the space for change is critical but context determines what is possible at any given time. Activities need to build on local interest and to take into account local strengths – which often are neglected – and weaknesses.[48] In this context, a few countries have done well, but on the whole donor efforts in many countries have produced little to show in terms of sustainable country capacity. Until recently, capacity development was viewed mainly as a technical process, and not enough thought was given to the broader political and social context within which capacity development efforts take place. This led to an overemphasis on what were seen as 'right answers', as opposed to approaches that best fit the country circumstances and the needs of the particular situation.[49]

Way Forward

In delivering support to a capacity development policy or programme, donors must remain aware of the institutional constraints and ensure that their own approach does not contribute to the problem – this involves not only understanding the country specific context but also the need to shift away from a results focused mentality towards longer term more progressive projects. For example, Project Implementation Units (PIUs) have often been blamed for diverting resources away from critical government functions and working against sustainable public sector capacity. When working with organisations, reaching agreement on the specific capacity development outcomes that are being pursued is an obvious but often neglected task[50]. Likewise, if capacity building programs are going to adequately support improved sector management, they will need to introduce more well-defined capacity building objectives and measures for achieving them. Beyond the need for internal coherence, the overall scope of capacity building support, like support for other development objectives, needs to match country demand for change in a given sector.[51]

[47] The Guardian (1st March 2011) "UK aid review designed to win over sceptical public". URL: http://www.guardian.co.uk/global-development/poverty-matters/2011/mar/01/uk-aid-review-bilateral-multilateral

[48] OECD (2011) Capacity Development: Lessons Learned and Actions for Busan and Beyond, Synthesis Report, Draft for Discussion at the Cairo Workshop on Capacity Development, p.15. URL: http://www.oecd.org/dataoecd/42/61/48146228.pdf

[49] OECD (2006) The Challenge of Capacity Development: Working Towards Good Practice http://www.fao.org/fileadmin/templates/capacitybuilding/pdf/DAC_paper_final.pdf

[50] Ibid.

[51] World Bank (2005) Capacity Building in Africa: An OED Evaluation of World Bank Support., p.33 URL http://lnweb90.worldbank.org/oed/oeddoclib.nsf/24cc3bb1f94ae11c85256808006a0046/5676a297fe57caf685256fdd00692e32/$FILE/africa_capacity_building.pdf

The OECD has recommended, for example, that partners need to now engage in a serious, collective effort to shape a results-based management system that can facilitate and enhance aid-supported capacity development. At the moment, they do not yet agree on an operational approach to results-based capacity development that can satisfy aid agency reporting systems while also providing the flexibility to realistically track and adjust to the fundamental change processes needed for long term impact.[52]

Communication and interlinked learning processes are also necessary means to progressing the effectiveness and sustainability of capacity building within the international development arena. As such, the introduction of processes for joint monitoring of aid agency and partner country behaviour in implementing capacity development good practice has been put forward by the OECD. Country level monitoring should be linked to well organised, joint learning processes which encourage meaningful change among aid agencies and partner countries alike. This joint action and the current interest in knowledge management should be a critical part of the larger development agenda, to which the international community should provide solid support.[53]

It is also important to realise the demand side of capacity building, so not only placing capacity building efforts within a country context, but in letting the people of the country decide on its design and progress. This may also involve initially enhancing peoples' capabilities to do so. The 'demand side' of what makes change in capacity happen stems from investing in education reform that includes literacy efforts linked with access to relevant knowledge, a progressive language policy that broadens opportunities for many otherwise unheard voices, and providing the safe space for citizenry to demand and dialogue around change.[54]

Capacity building is not just about the needs of the State, but the needs of the people as determined in collaboration with the state. Thus capacity needs assessments must be based on an open and consultative process. A number of capacity development strategies can be used to strengthen citizen-state interfaces and enable institutions to better respond to citizens' needs as outlined by the UNDP. These include creating interactive planning and policy frameworks that involve and empower grass roots organizations; investing heavily in demand side capacities to connect diverse populations to state institutions (i.e. private sector alliances against corruption or civil society coalitions in key technical areas, such as procurement); using public-private partnerships to provide affordable access to mobile phones and other technologies and therefore directly supporting individual capacities; investing in literacy and other basic education programmes, as well as in the legal empowerment of the poor; and promoting the use and learning of both local and global languages.[55]

[52] OECD (2011) Capacity Development: Lessons Learned and Actions for Busan and Beyond, Synthesis Report, Draft for Discussion at the Cairo Workshop on Capacity Development, p.15. URL: http://www.oecd.org/dataoecd/42/61/48146228.pdf
[53] OECD (2011) Capacity Development: Lessons Learned and Actions for Busan and Beyond, Synthesis Report, Draft for Discussion at the Cairo Workshop on Capacity Development, p.15. URL: http://www.oecd.org/dataoecd/42/61/48146228.pdf
[54] UNDP (2010) 'Capacity is Development' A Global Event on Smart Strategies and Capable Institutions for 2015 and Beyond; A Report; Marrakech, Morocco 17-19 March 2010 (www.capacityisdevelopment.org) URL: http://www.beta.undp.org/content/dam/aplaws/publication/en/publications/capacity-development/2010-capacity-is-development-global-event-final-report/2010%20'Capacity%20is%20Development'%20Global%20Event%20-%20A%20Report.pdf
[55] UNDP (2010) 'Capacity is Development' A Global Event on Smart Strategies and Capable Institutions for 2015 and Beyond; A Report; Marrakech, Morocco 17-19 March 2010 (www.capacityisdevelopment.org) URL: http://www.beta.undp.org/content/dam/aplaws/publication/en/publications/capacity-development/2010-capacity-is-development-global-event-final-report/2010%20'Capacity%20is%20Development'%20Global%20Event%20-%20A%20Report.pdf

Chapter 38: International Institutional Arrangements

Introduction

In the decades leading up to UN Conference on Environment and Development (UNCED) in 1992, environment and development issues had grown in complexity. Since the Stockholm conference in 1972, environment had been accorded limited priority within government administrations in many countries, and international environmental governance experienced fragmentation within itself. A UN reform process was ongoing in the economic and social fields, and many actors saw the Rio process as a unique opportunity to address unprecedented challenges by bringing about improvements in governance. It was obvious that Agenda 21 could not be effectively followed up without broad institutional solutions.

Negotiations on institutional follow-up started early in the UNCED preparation process. The general view was to build upon the existing institutional arrangements and to let form follow function. The question arose on whether any new body would need to be established, and some different proposals circulated in that regard, among which the idea for a Commission on Sustainable Development (CSD) was met with most interest and finally got adopted. The negotiations on institutional arrangements were concluded during the first week of the Rio Conference without major controversies remaining. However, in order to accommodate many diverse views and interests, Chapter 38 became a lengthy text of 45 paragraphs.

The institutional chapter of Agenda 21 focuses mainly on arrangements within the UN system, since those could be influenced in the most direct way. The chapter also covers needed responses from international financial organizations and includes recommendations to governments to put in place decentralized mechanisms for implementation. The room for maneuver was, however, limited already from the beginning, since UNCED had no authority over the Bretton Woods institutions and Economic and Social Council (ECOSOC) had a low status within the UN system.[1]

Implementation

The overall objective of Chapter 38 was to ensure integration of environment and development issues in governance at all spatial levels and in the UN system. In addition there are nine specific objectives listed. Importantly, all relevant agencies, programmes and organizations in the UN should adopt concrete programmes for the implementation of Agenda 21. They are required to elaborate and publish reports of those activities on a regular basis, including reviews of their policies and budgets for Agenda 21.

[1]Engfeldt, Lars-Göran (2009). *From Stockholm to Johannesburg and Beyond. The evolution of the international system for sustainable development governance and its implications.* The Government Offices of Sweden.

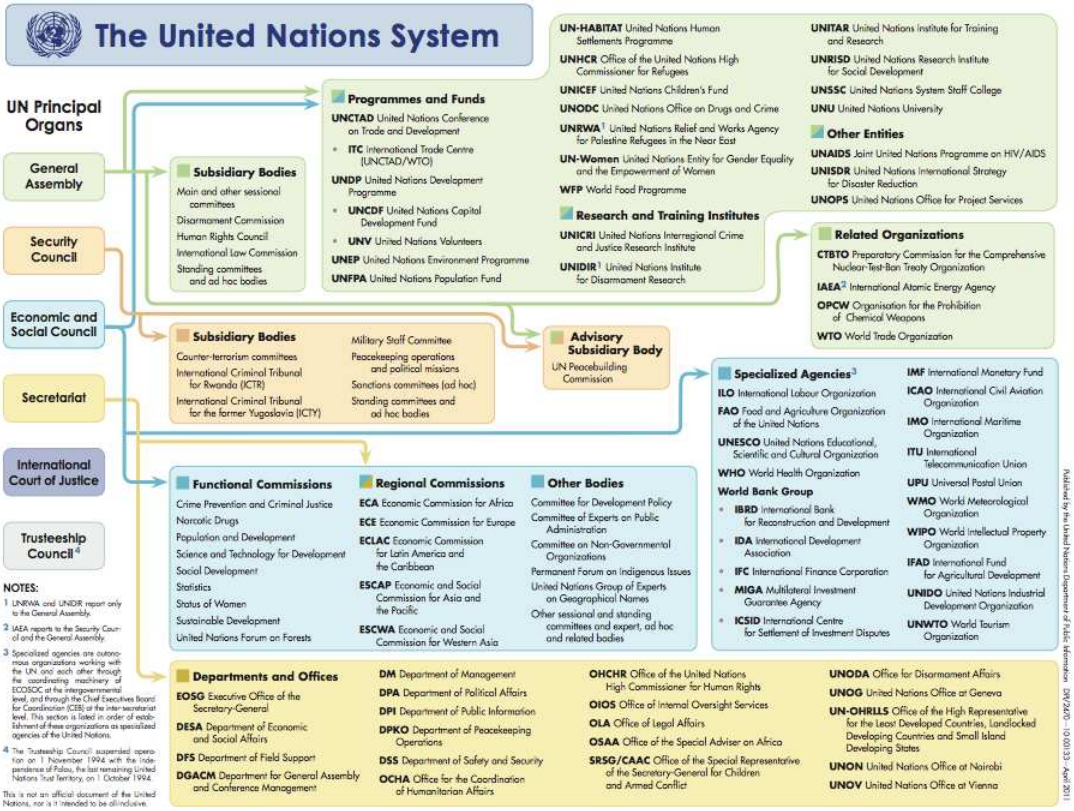

Figure 1. UN Organizational Chart
Source: http://www.un.org/en/aboutun/structure/org_chart.shtml

General Assembly

Chapter 38 emphasizes that the UN General Assembly (UNGA) should be the principal organ for the follow-up of UNCED. Many developing countries advocated for control by the UNGA due to its universal membership, and the final formulation was a compromised attempt to accommodate Norway and others who would have favored a new body to be established under the UNGA.[2]

The UNGA organized a Special Session (UNGASS or "Rio+5") for review of Agenda 21 in 1997. Attendance was high, and although UNGASS did not adopt a political declaration, a carefully negotiated "Programme for the Further Implementation of Agenda 21" was agreed.[3] With this covered, the UNGA had fulfilled the particular task lined out for it in Chapter 38.

In 2002, the role of the UNGA was renewed in that the Johannesburg Plan of Implementation stated "The General Assembly of the United Nations should adopt sustainable development as a key element of the overarching framework for United Nations activities, particularly for achieving the internationally agreed development goals, including those contained in the Millennium Declaration, and should give overall political direction to the implementation of Agenda 21 and its review."[4]

[2]ibid
[3]UN doc A/S-19/33 resolution S/19-2.
[4]UN (2002) *Johannesburg Plan of Implementation.*
http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/POIchapter11.htm

On 24 December 2009, the General Assembly passed a resolution for organizing the United Nations Conference on Sustainable Development (UNCSD) 'at the highest level possible' in Rio de Janeiro in 2012.[5]

Economic and Social Council

Chapter 38 emphasizes that the role of ECOSOC should be strengthened as a coordination body for sustainable development and Agenda 21 implementation within the UN system. ECOSOC is responsible for organizing a periodic review of the work of the Commission on Sustainable Development (CSD). This has been done regularly, and ECOSOC elects the CSD members. ECOSOC was also tasked to interact with the UNGA and to push other UN entities and specialized agencies to report on their Agenda 21 activities. In those regards, ECOSOC's sustainable development coordination relies on the action of the CSD.

At the 2005 World Summit, Heads of State and Government mandated ECOSOC to conduct an Annual Ministerial Review (AMR) to assess progress made to the Millennium Development Goals and other goals and targets agreed at major UN conferences. In 2008, the AMR was held in New York in July and focused on "Implementing the internationally agreed goals and commitments in regard to sustainable development".[6] The AMR report made several recommendations for how to strengthen governance and other areas to support urgent implementation of Agenda 21 and global consensus decisions on sustainable development.[7]

Commission on Sustainable Development

The Commission on Sustainable Development (CSD) was established and given the mandate to review progress towards globally agreed goals and targets for sustainable development and Agenda 21 implementation. This was a major achievement given the complex political conditions in the Rio process. The 1997 review concluded that in its first five years, the CSD had catalyzed commitments and new action and contributed to the deliberations on sustainable development among actors both within and outside the UN system.[8] After 2003, it was decided that the CSD would best function with a bi-annual agenda, focused on particular thematic clusters. The first year would be a review year, and the second year was meant to produce policy recommendations.

The Secretary-General

As head of the UN and a prominent figure in the eyes of the public, the UN Secretary-General can play an important leadership role in defining priorities on the global agenda. Chapter 38 asked the Secretary-General to be the focal point of the institutional arrangements for Agenda 21. There have been three Secretary-Generals since UNCED: Boutros Boutros-Ghali (1992-96), Kofi Annan (1997-2006), and Ban Ki-moon (recently re-elected until 2016). In the crucial first years after UNCED, the Secretary-General supported the follow-up by facilitating the establishment of institutional structures as envisioned in Agenda 21.

When Kofi Annan took office he promoted a coherent UN vision and strategy, which led to the adoption of the Millennium Development Goals in 2000. This was a first step in the direction towards one single agenda for development. Kofi Annan also played a leadership role in the Johannesburg Summit in 2002.[9] In preparation for the Summit, the Secretary-General issued a 63-

[5]UNGA resolution (2010) http://www.uncsd2012.org/files/OD/ARES64236E.pdf
[6]ECOSOC website – 2008 Annual Ministerial Review, accessed July 2011 http://www.un.org/en/ecosoc/newfunct/amr2008.shtml
[7]UN ECOSOC (2008). Annual ministerial review: implementing the internationally agreed goals and commitments in regard to sustainable development. Report of the Secretary-General.http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/312/67/PDF/N0831267.pdf?OpenElement
[8]UN (1997). *Programme for the Further Implementation of Agenda 21*. UNGA S/19-2. http://www.un.org/documents/ga/res/spec/aress19-2.htm
[9]UN (2002b) *Sustainable Development Summit Concludes in Johannesburg: UN Secretary-General Kofi Annan Says It's Just the Beginning*. Press release 4 September.

page report analyzing progress and gaps in implementing Agenda 21 and proposals for how to move forward to realize the goals.[10] Ban Ki-moon has kept sustainable development and climate change among the top priorities on the UN agenda and is involved in preparations for UNCSD 2012.[11] On 9 August 2010 he launched a new High-level Panel on Global Sustainability (GSP), tasked to formulate a new blueprint for a sustainable future and issue a report by the end of 2011. The GSP report will feed into UNCSD in 2012 and other intergovernmental processes.[12]

High-level Inter-agency Coordination Mechanism

An Interagency Committee on Sustainable Development (IACSD) was established under the Administrative Committee on Coordination (ACC) in 1992, tasked to ensure effective system-wide cooperation and coordination in the follow-up to UNCED.[13] IACSD was composed of representatives from nine core agencies with particular responsibilities for different aspects of Agenda 21 implementation.[14] This decentralized system of task managers, in which staff members from the relevant UN agencies were responsible for collecting all interagency input for the CSD, made officials on the working level realize the advantages of working together. The approach made use of each member's comparative advantages in different thematic areas of Agenda 21 implementation.

In 1997, the UNGASS concluded that it was necessary to strengthen IACSD and its task manager system in order to further enhance intersectoral cooperation and system-wide coordination for the implementation of Agenda 21.[15] IACSD held its 15th meeting in 2000.[16] However, a major reorganization of the UN Secretariat in the same year saw the ACC and its subsidiary structures, including IACSD, replaced by the UN System Chief Executives Board for Coordination (CEB). CEB meets twice annually, is chaired by the Secretary-General and includes the heads of agencies and institutions of the UN system. It is supported by three sub-committees and works on various thematic issues including the Millennium Development Goals.[17]

With the loss of the interagency coordination function of IACSD, the Environment Management Group (EMG) was created through UNGA resolution A/RES/53/242 in 1999. With the purpose of "enhancing inter-agency coordination in the field of environment and human settlement",[18] the EMG is the closest equivalent coordination mechanism today. Some other structures were set up to continue interagency coordination on a more thematic basis, such as UN-Energy, UN-Water, and UN-Oceans.

High-level Advisory Body

A High-level Advisory Board on Sustainable Development was established in 1993 to advise the Secretary-General and CSD on issues related to Agenda 21. The Board would consist of 15-25

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http://www.un.org/events/wssd/pressreleases/finalrelease.pdf

[10]UN ECOSOC (2002). *Implementing Agenda 21. Report of the Secretary-General.* http://www.earthsummit2002.org/es/preparations/global/Microsoft%20Word%20-%20SG%20report.pdf

[11]UN (2011) *General Assembly Appoints Secretary-General Ban Ki-moon to Second Term of Office*. Press release 21 June. http://www.un.org/News/Press/docs//2011/ga11102.doc.htm

[12]UN GSP website, accessed 2011-07 http://www.un.org/wcm/content/site/climatechange/pages/gsp

[13]http://www.unsceb.org/ceb/about/iacsd (IACSD)

[14]Bigg, Tom (1995) *The UN Commission on Sustainable Development: A Non-Governmental Perspective*. Global Environmental Change Vol 5 Iss 3 p 251 Elsevier Science Ltd. http://www.sciencedirect.com/science/article/pii/095937809500049T

[15]UNGASS decision 1997

[16]UN (2000) *Report of the Inter-Agency Committee on Sustainable Development at its fifteenth meeting* http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N00/298/35/PDF/N0029835.pdf?OpenElement; UN (2002) *United Nations Document Repository: Administrative Committee on Coordination.* http://www.un.org/esa/documents/acc.htm

[17]UN CEB website, accessed 2011-07-04http://www.unsceb.org/ceb/brochure/overview/

[18]UN (1999) General Assembly resolution A/RES/53/242 http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N99/773/95/PDF/N9977395.pdf?OpenElement

internationally recognized personalities appointed by the Secretary-General in their personal capacity.[19] In the first years the Board acted under circumstances that were not politically favorable.[20]For a while it had three ongoing working groups to address different key issues. In 1994 it was widely criticized for its relative ineffectiveness.[21]
For the Rio+5 session in 1997, a recomposed Board presented a report entitled "Critical Issues and Sustainable Development: Energy, Transport and Water".[22] This can be seen as an important step in the successive legitimization of energy and transport as broad issues for the UN to be concerned about.[23] Today there is a UN Secretary-General's Advisory Board on Water and Sanitation (UNSGAB), collaborating closely with the inter-agency mechanism UN-Water formally established in 2003.[24]

As mentioned above, in 2010 the Secretary-General launched a new High-level Panel on Global Sustainability (GSP) that can be compared to the High-level Advisory Body envisioned in Chapter 38 of Agenda 21.[25]

Secretariat Support Structure
In the years after UNCED, the UN Department of Policy Coordination and Sustainable Development (DPCSD) provided secretarial support for Agenda 21 implementation. In a major reorganization of the UN Secretariat in 2000, DPCSD merged into the Department of Economic and Social Affairs (DESA) under the ECOSOC. Since then, DESA's Division for Sustainable Development (DSD) is tasked to play a coordinating role on sustainable development across the UN system and to provide secretariat functions to the CSD. Located in New York at the UN Headquarters, DSD is one of DESA's nine functional divisions. In addition to serving the CSD, the Division hosts the Secretariats of UN-Energy and UN-Water and supports UN-Oceans. DSD works to implement Agenda 21, the Johannesburg Plan of Implementation, the Barbados Programme of Action, and the Mauritius Strategy of Implementation for Sustainable Development of Small Island Developing States. It provides capacity-building, analysis and research to support decision-making on sustainable development.[26] DESA also commissioned this study to facilitate informed decisions at UNCSD in 2012.

Organs, Programs & Organizations of the United Nations System

United Nations Environment Programme (UNEP)
UNEP has played an important role in Agenda 21 implementation. Pursuant to a UN General Assembly decision in 1999, UNEP has hosted an annual Global Ministerial Environment Forum (GMEF) in conjunction with its Governing Council since the year 2000. The GMEF enables the world's environment ministers to gather in one place to discuss emerging and important environmental issues, review progress to meet existing agreements and set new goals for the future.[27]

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[19]UN ECOSOC (1993). *High-Level Advisory Board on Sustainable Development.* http://www.un.org/documents/ecosoc/docs/1993/e1993-15.htm
[20]Engfeldt, Lars-Göran (2009). *From Stockholm to Johannesburg and Beyond. The evolution of the international system for sustainable development governance and its implications.* The Government Offices of Sweden.
[21]Bigg, Tom (1995) *The UN Commission on Sustainable Development: A Non-Governmental Perspective*. Global Environmental Change Vol 5 Iss 3 p 251 Elsevier Science Ltd.
http://www.sciencedirect.com/science/article/pii/095937809500049T
[22]UN (1997) *Critical Issues and Sustainable Development: Energy, Transport and Water.* Report by the High-level advisory board on sustainable development.
http://www.un.org/esa/documents/ecosoc/cn17/1997/ecn171997-17add1.htm
[23]Engfeldt 2009
[24]UN-Water, accessed in July 2011http://www.unwater.org/discover.html
[25]UN GSP website, accessed 2011-07 http://www.un.org/wcm/content/site/climatechange/pages/gsp
[26]UN DESA DSD website http://www.un.org/esa/dsd/dsd/dsd_index.shtml
[27]UNEP.org about GMEF

UNEP has contributed new knowledge on sustainable development through its integrated environmental assessment project "Global Environment Outlook" (GEO) established in 1995. For example, the third GEO report published in 2002 provided major input to the World Summit on Sustainable Development (WSSD) in Johannesburg, taking a 30 year retrospective to the Stockholm Conference in 1972 and a 30 year forward looking perspective on trends for global environmental developments. A solutions-oriented 5th GEO report is scheduled for publication timely for the UNCSD conference in 2012.

Endless debates on reform of international environmental governance (IEG) are testament to the fact that there is a strong commitment from many quarters to enhance UNEP and make it more effective. The latest IEG reform process identified five options for broader reform, summarized in the Nairobi-Helsinki Outcome.[28] The UNEP Governing Council in February 2011 endorsed the Nairobi-Helsinki Outcome and tasked the Preparatory Committee for UNCSD 2012 to elaborate and consider the reform options further.[29]

United Nations Development Programme (UNDP)

The comparative strength of UNDP is its operational activities on the ground, with active field offices in most developing countries. Chapter 38 asked UNDP to take a leading role in capacity-building at the local, national and regional levels, mobilize resources, strengthen the role of major groups and assist recipient countries. UNDP's main instrument for implementing Agenda 21 was the Capacity 21 programme, established in 1993 without a timeline for when it should close down. By 2002, UNDP had assisted over 40 developing countries through its Capacity 21 programme in formulating and implementing national sustainable development strategies through building their human and institutional capacities.[30] An independent team of evaluators concluded in 2002 that Capacity 21 had operated under uncertain economic conditions in a peripheral position within UNDP, but had nevertheless made significant contributions to sustainable development on the national level. In this context UNDP promoted the involvement of many major groups as stakeholders in national sustainable development processes. [31] UNDP has not applied the Major Groups model for participation in its own international governance though. Today UNDP's work is highly focused on poverty eradication and implementation of the Millennium Development Goals.[32] UNDP also has a global portfolio of activities on the environment, for which the budget is bigger than the entire budget of UNEP.

United Nations Conference on Trade and Development (UNCTAD)

UNCTAD was best positioned to play a role in Agenda 21 implementation by its focus on the interrelations between development, international trade and the environment. In a first attempt to analyse trade and environment linkages in developing countries, UNCTAD and UNDP carried out the project 'Reconciliation of Environment and Trade Policies' 1993-1996, producing a series of country case studies through local research institutes. Since then, UNCTAD has continued its close collaboration with other intergovernmental organizations and major groups on issues related to Agenda 21 and serving as a UN system-wide task manager. UNEP and UNCTAD joined

[28]Nairobi-Helsinki Outcome 2010
[29]UNEP GC decision February 2011
[30]UN ECOSOC (2002). *Implementing Agenda 21. Report of the Secretary-General.* http://www.earthsummit2002.org/es/preparations/global/Microsoft%20Word%20-%20SG%20report.pdf
[31]UNDP (2002) *Capacity 21: Global Evaluation 1993-2001.* http://www.beta.undp.org/content/dam/aplaws/publication/en/publications/capacity-development/cap21_global_evaluation_1993-2002/Capacity%2021%20Global%20Evaluation%20Report%201993-2001.pdf
[32]UNDP http://www.beta.undp.org/undp/en/home/mdgoverview.html

together to launch a Capacity Building Task Force on Trade, Environment and Development in 2000.[33]

United Nations Sudano-Sahelian Office

In preparation for UNCED, the then existing United Nations Sudano-Sahelian Office (UNSO) played a major role in facilitating the recognition of drought and desertification as universal issues to be incorporated in Agenda 21, which resulted in Chapter 12 on "Managing Fragile Ecosystems: Combating Desertification & Drought". Chapter 38 recommends that UNSO's role should be strengthened into a major advisory role in implementation of those issues. As a follow-up, UNSO was instrumental in bringing about the establishment of the United Nations Convention to Combat Desertification (UNCCD) and played an important role in speeding up its implementation by making experience in combating drought and desertification available to affected countries.

UNSO's mandate outlined in Chapter 38 focused primarily on providing support to the least developed countries in Africa. It later expanded to assisting 29 countries in Africa, 22 in Asia and 19 in Latin America and the Caribbean in developing sub-regional and national action plans to mitigate the effects of drought and combat desertification.

Since 2002, UNSO is known as the UNDP Drylands Development Centre (DDC). The office was relocated from New York to Nairobi in an effort to bringing the services closer to programme countries. The transformation aimed at strengthening its institutional capacity. In collaboration with country offices of UNDP, the DDC developed the Integrated Drylands Development Programme (IDDP). A second phase of this strategic programme framework started in 2010.[34]

Specialized Agencies of the United Nations system and related organizations and other relevant intergovernmental organizations

Specialized agencies and others in the UN system were asked to contribute to Agenda 21 even if they were not independently listed in Chapter 38. Since they were required to report on how they had strengthened and adjusted their activities and programmes in line with Agenda 21, most of them have promoted sustainable development with varying degrees of ambition. Some have responded with enthusiasm and actively strived to incorporate sustainable development in their agendas and programmes of work, while others mainly added the rhetoric to activities they would perhaps have carried out anyway.

Many UN agencies and organizations served as task managers for specific chapters of Agenda 21 matching with their area of expertise. For example, the Food and Agriculture Organization (FAO) played a special role for Chapter 10 on land resources, Chapter 11 on forest management, Chapter 13 on sustainable mountain development and 14 on sustainable agriculture and rural development.[35] UN-Habitat took responsibility for Chapter 7 on sustainable settlements, Chapter 21 on waste and sanitation, and Chapter 28 on Local authorities.[36] UNESCO was appointed task manager for Chapter 36 on Education, Awareness and Training. UNESCO has carried out many activities in that regard, including the current Decade of Education for Sustainable

[33]UNCTAD (2004). *Beyond Convetional Wisdom in Development Policy – An Intellectual History of UNCTAD 1964-2004*.http://www.unctad.org/en/docs/edm20044_en.pdf

[34]UNDP DDC http://www.undp.org/drylands/history.html

[35]FAO http://www.fao.org/wssd/docs/WSSD01_en.pdf

[36]UN-Habitat http://ww2.unhabitat.org/wssd/ed_report.html

Development.[37]

In addition to existing organizations, a growing number of new inter-agency bodies with an issue-specific specialization have been established in the UN system since Rio 1992, such as UN-Water in 2003 and UN-Energy in 2004.[38] The International Renewable Energy Agency (IRENA) from 2009 is an example of a newly established body in the sustainable development field.[39]

Regional and Subregional Cooperation and Implementation

Many regional initiatives grew out of the UNCED process. Ministerial-level meetings were held in all geographical regions as a follow-up to the conference, and were often attended by ministers outside the environmental domain. These meetings helped translate the global goals into regional issues and priorities and adopted policies to enhance capacity-building and institutional development of Agenda 21 implementation on national level.[40] For example, the secretariat of the African Ministerial Conference on the Environment (AMCEN) organized some regional post-Rio meetings to follow up Agenda 21.[41]

New forms of interagency cooperation emerged at the regional level as well. The regional commissions gathered regional representatives of different global UN programmes and agencies to exchange experiences and coordinate their efforts in Agenda 21 implementation. For example, Asia and the Pacific adopted a Regional Action Programme, the Arab Region established a Joint Committee on Environment and Development, and Western Asia convened an Economic and Social Commission in cooperation with UNEP and FAO.

On the European level, a European Environment and Sustainable Development Advisory Councils (EEAC) was set up in 1993 and is still acting as a coordinating body for a unique collaboration network between around 30 councils set up by 16 European governments to provide advice on environment and sustainable development.[42]

In 1997, the review of Agenda 21 implementation concluded that it would be necessary to achieve a better balance between work at the global and regional levels, since that would be essential for success in the next stage of Agenda 21. The review also recommended exploring the option of entrusting the UN regional commission with a more active coordination role.[43]

Regional Ministerial Meetings were held prior to the World Summit on Sustainable Development in 2002 to consider progress made in the regional implementation of Agenda 21 and set priorities for action based on major regional challenges on the road to sustainable development. For example, the European meeting in September 2001 had more than 30 ministers and high-level officials in attendance.[44]

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[37]UNESCO
http://portal.unesco.org/en/ev.php-URL_ID=5434&URL_DO=DO_TOPIC&URL_SECTION=201.html
[38]UN-Water http://www.unwater.org/discover.html; UN-Energy http://www.un-energy.org/about
[39]IRENA http://www.irena.org/Menu/index.aspx?PriMenuID=13&mnu=Pri
[40]UN (1997) *Overall progress achieved since the United Nations Conference on Environment and Development – Report of the Secretary-General. Addendum: International institutional agreements.* E/CN.17/1997/2/Add.28
[41]AMCEN Secretariat (2006) History of the African Ministerial Conference on the Environment 1985-2005
http://www.unep.org/roa/Amcen/docs/publications/AMCENHistory.pdf
[42]EEAC http://www.eeac-net.org/
[43]UN (1997d) *Review and Appraisal of the Implementation of Agenda 21.*
http://www.un.org/documents/ga/docs/S-19/plenary/as19-6.htm
[44]Johannesburgsummit.org
http://www.johannesburgsummit.org/html/prep_process/europe_northamerica/european_prepcom_chairmans_summary.pdf

National Implementation
Member states were asked to develop national action plans and to report on their implementation of Agenda 21. They were encouraged to set up a national coordination structure and to include the expertise of non-governmental organizations. In 1997, the Programme for the Further Implementation of Agenda 21 decided that all countries should have formulated national sustainable development strategies by 2002. Around 85 countries had done so at that time, but with varying levels of scope and effectiveness.[45]

Better institutional connections are still needed between the national and intergovernmental levels in sustainable development governance. In the first phase of CSD, before Johannesburg, the level of response to Agenda 21 in countries around the world was promising. More than 2000 Local Agenda 21's were adopted and national strategies for sustainable development created as a direct effect of UNCED.[46] National hearings were held and governments encouraged or required their local authorities to participate in the efforts. Civil society was often involved and reports reached the CSD. In the last decade though, there has been a decrease in the interest to produce national reports, they are fewer and most of the ones that do exist have not been developed through a participatory process.[47]

Cooperation Between UN Bodies and International Financial Organizations
Aware that the success of the follow-up to the conference depended on an effective link between substantive action and financial support, multilateral financial organizations were called upon to cooperate with the UN bodies. In line with the Paris Declaration on Aid Effectiveness from 2005, most International Financial Institutions (IFIs) have increased the responsibility delegated to the borrowers, which helps building local ownership and capacity for sustainable development. One IFI is the World Bank, which has funded some controversial projects throughout the years. In 2006 the World Bank started a Sustainable Development Network to provide financial resources to projects on relevant issues. Borrowers are now required to undertake environmental impact assessments for proposed projects. While the World Bank appears to have become a more environmentally and socially responsible actor since UNCED through this initiative and a number of reforms, the Bank's approach has been criticized.

The World Bank has been active in the UNFCCC negotiations and was appointed interim trustee for the Green Climate Fund created by governments in Cancún in 2010. However, the Bank has not committed to improve its own climate and sustainable development footprint. There is need for greater accountability and coherence in the link between IFIs and global governance for sustainability.[48]

Non-Governmental Organizations
Section 3 of Agenda 21 is devoted entirely to the inclusion of stakeholders, in particular the nine major groups Business & Industry, Children & Youth, Farmers, Indigenous Peoples, Local Authorities, NGOs, Science & Technology, Women, Workers & Trade Unions. Although Chapter

[45]UN ECOSOC (2002). *Implementing Agenda 21. Report of the Secretary-General.*
http://www.earthsummit2002.org/es/preparations/global/Microsoft%20Word%20-%20SG%20report.pdf
[46]Andresen, Steinar (2007). *The Effectiveness of UN Environmental Institutions.* International Environmental Agreements: Politics, Law and Economics. Vol 7, No 4, p 17-336.
[47]Strandenaes, Jan-Gustav. *Sustainable Development Governance towards Rio+20: Framing the Debate.* Sdg 2012 series, Stakeholder Forum.
http://www.stakeholderforum.org/fileadmin/files/sdg2012jangustav.pdf

[48]Hebertson, Kirk (World Resources Insitute) *Greening the International Financial Institutions (IFI's): Finance for the Next Decade's Sustainable Development.* Stakeholder Forum Sdg2012 series.

38 doesn't list the nine groups again, it embraces the concept of including non-state actors for ensuring successful institutional follow-up after UNCED.

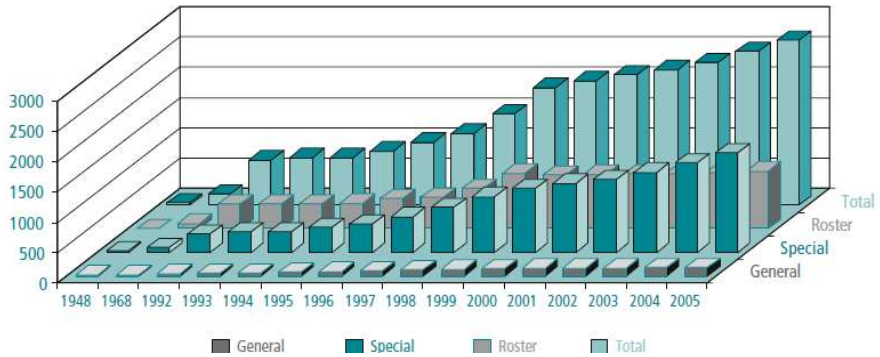

Figure 3. NGOs in consultative status since 1948, by category
Source: Negotiating and Implementing MEAs: A Manual for NGOs, p 30

Chapter 38 took note of proposals for institutional initiatives that had been promoted by civil society in the UNCED process, such as a non-governmental Earth Council and a guardian for future generations. A few states such as Hungary have appointed national future generation guardians, while Wales has a Commissioner for Sustainable Futures.[49] The Earth Council established a secretariat to coordinate the Earth Charter, a declaration signed by millions of people and organizations around the world. The Earth Council was also instrumental in setting up more than 80 National Councils for Sustainable Development in developing countries 1992-1998. With a focus on grassroots action, the Councils have monitored government compliance with the commitments made and to facilitate partnerships for creative Agenda 21 implementation.[50]

Challenges and Conflicts

Institutional Challenges

The institutional arrangements outlined in Chapter 38 are a result of negotiation and compromise. Therefore, the structure includes overlapping mandates and is not ideal for effective and efficient implementation through a coherent institutional support structure. The Commission on Sustainable Development (CSD) focuses on Agenda 21 implementation and coordination across UN bodies, but has not had the authority to force this through due to its low status. The CSD Secretariat in DESA is facing serious challenges, and the broader ECOSOC lacks in effectiveness and is weak in the UN system as a whole. The system has also become rather fragmented due to the multiple and overlapping Multilateral Environmental Agreements (MEAs).

Lack of Coordination

Interagency coordination is one of the areas that the general consensus says we need more of, but since many actors are reluctant to be coordinated, the structures to do it come and go. Periodic reform efforts often get rid of what is useful but easy to remove, and leave behind useless structures with more vested interests to protect them. The Interagency Committee on Sustainable Development (IACSD) with its system of task managers was abolished even though it was

[49] Engfeldt 2009
[50] Earth Council http://www.earthcouncilalliance.org/

regarded successful in general.[51] Members on the IACSD found it was a very useful and effective coordination body and were surprised at its disappearance.[52] An effective interagency coordination mechanism on sustainable development is missing today.

Weakness of UNEP

The United Nations Environment Programme (UNEP) is unable to live up to its mandate as the anchor organization for the global environment. The limited performance can be explained by a combination of several factors, including its location, leadership, and the design of its form, functions, and financing.[53] Agenda 21 recognized UNEP's challenges and aimed to provide the organization with increased expertise and adequate financial resources. However, despite its mandate to lead in the environmental field, UNEP is given less money annually than UNDP's environment budget. UNEP was not in the political focus of negotiations in Rio 1992, and the establishment of the CSD as an additional major platform for environment ministers did not strengthen UNEP's position.[54] Frequent reform processes in the field of international environmental governance show willingness to strengthen UNEP and have developed several proposals for how to do it, but there is still a long way to go before UNEP can meet the mandate originally envisioned for it.

CSD Ineffectiveness

The CSD has also been ineffective in living up to its mandate. Although the CSD is charged with an important role and has commendable aims and objectives, it retains fairly low-level governmental buy-in and bears little credit for affecting national policy on sustainable development worldwide. It fails to capture public and media attention and has declining ministerial attendance. The closing of the recent 19th session the CSD with no agreed outcome has evidenced that its members are far from reaching any lasting and impactful sustainable development regime. CSD also lacks a financing element and is not coupled with mechanisms for implementation, resulting in a lack of responsibility and accountability for the outcomes.[55]

Finance Gaps

As described in the assessment of Chapter 33, there is a serious lack of financial resources for implementation of Agenda 21. This applies also to the institutional provisions outlined in Chapter 38. The amount of funding accessed from International Financial Institutions as well as national voluntary contributions has been a disappointment. The UK government recently stopped funding to a number of UN institutions. That pressure for austerity at home is making it difficult to justify further funding to UN bodies.

Declining National Coordination

Although Agenda 21 puts emphasis on the crucial importance of national follow-up mechanisms, there is a lack of national reporting and implementation in many countries. Some member states have taken Agenda 21 implementation seriously, but after the initial enthusiasm in the years after UNCED, the second decade has seen a declining engagement. Many countries established National Councils for Sustainable Development in the decade after Rio, but in most cases they are less active now than in the beginning, and some have ceased to exist. For example, the UK

[51] http://www.unsceb.org/ceb/about/iacsd
[52] Arthur Dahl (dahla@bluewin.ch), task manager on IACSD for Agenda 21 chapter 40.
[53] Ivanova, Maria (2010) UNEP in Global Environmental Governance: Design, Leadership, Location. Global Environmental Politics 10:1, p 30-59.
[54] Engfeldt 2009.
[55] Stoddart, Hannah (ed.) (2011). *A Pocket Guide to Sustainable Development Governance.* First Edition, Stakeholder Forum and the Commonwealth Secretariat.
http://www.uncsd2012.org/rio20/index.php?page=view&type=400&nr=27&menu=45

Sustainable Development Commission created in 2000 used to hold the Government accountable and ensure balanced decisions for the needs of society, the economy and the environment, but it was closed down on 31 March 2011.[56]

Way Forward

The Institutional Framework for Sustainable Development is one of the two themes of the UNCSD conference in 2012 and there are a number of reform options that need to be addressed:

Outcomes of the Nairobi-Helsinki Process
The latest reform process for International Environmental Governance under the auspices of UNEP outlined the following institutional options:

(a) Enhancing UNEP;
(b) Establishing a new umbrella organization for sustainable development;
(c) Establishing a specialized agency such as a world environment organization;
(d) Reforming the United Nations Economic and Social Council and the United Nations Commission on Sustainable Development;
(e) Enhancing institutional reforms and streamlining existing structures.[57]

UNEP as a Specialized Agency
One of the more contentious issues on the table is the option of upgrading UNEP by turning it into a Specialized Agency. This possibility has been discussed on an intergovernmental level for over a decade. The Nairobi-Helsinki Outcome called it a World Environment Organization (WEO), and the French proposal from 2003 used the name United Nations Environment Organization (UNEO) for the new agency. In addition to several political proposals, many scholars have looked into the possibility and suggested different models. Most proposals envision the WEO or UNEO as an independent legal entity with the same status in the UN system as the World Trade Organization and the World Health Organization and suggest that it would enhance coordination across UN agencies, guarantee funding for the environment through assessed contributions, and have the authority to adjudicate on international environmental disputes. It has the potential to address fragmentation in the Multilateral Environmental Agreement system by providing an umbrella organization for all MEAs.[58]

Sustainable Development Council
Another proposal on the table is the possibility of creating a Council on Sustainable Development. One possibility could be to merge the Economic and Social Council (ECOSOC) and the Commission on Sustainable Development (CSD), which are both widely recognized as being in need of reform, into such a Council. UNEP's Global Ministerial Environment Forum could potentially become a functioning commission on the environment under the Council.[59]

National Councils on Sustainable Development
Success stories in regard to local implementation of Agenda 21 have often happened with the help of National Councils on Sustainable Development (NCSD). Establishing or revitalizing NCSDs in all countries, and developing their effectiveness and experience sharing, would be a

[56]UK Sustainable Development Commission, archive site http://www.sd-commission.org.uk/
[57]Nairobi-Helsinki Outcome
[58]Stoddart, Hannah (ed.) (2011). *A Pocket Guide to Sustainable Development Governance.* First Edition, Stakeholder Forum and the Commonwealth Secretariat.
http://www.uncsd2012.org/rio20/index.php?page=view&type=400&nr=27&menu=45
[59]Stoddart, Hannah (ed.) (2011). *A Pocket Guide to Sustainable Development Governance.* First Edition, Stakeholder Forum and the Commonwealth Secretariat.

way to strengthen the crucial link between different spatial levels of governance. It can bring the globally agreed goals from Agenda 21 closer to the ground, facilitating implementation on the local level.

Other options

In addition to the examples given above, there are several other ambitious options for reform. Rio 2012 is an important opportunity to bridge the governance gaps and make sure to establish the institutional structure that best supports implementation.

Chapter 39: International Legal Instruments and Mechanisms

Introduction

Agenda 21 is a soft-law non-binding instrument, but has been a significant catalyst for the generation and application of legally binding agreements in the environment and development domains.[1] Chapter 39 of Agenda 21 establishes sustainable development as a component of international law – a significant breakthrough in the status of sustainable development at an international level.[2]

International law for sustainable development aims to bridge the gaps and provide legal guidance in the intersection between economic, social, and environmental obligations. International law in the fields of environment, trade and investment, human rights and development were all challenged to take wider perspectives into account in order to contribute to meeting the needs of present and future generations.

In the field of international environmental law, an issue-specific system of multilateral environmental agreements (MEAs) had evolved incrementally and rather ad-hoc in the decades before UNCED. An important objective of Chapter 39 was to evaluate and promote the efficacy of international environmental law through substantive and procedural adjustments. Many environmental agreements had been designed without adequate contribution and participation by developing countries and were in need of renegotiation for greater legitimacy. In order to accommodate developing countries, Chapter 39 puts emphasis on the delicate balance between developmental and environmental concerns and promotes the further development of international law on sustainable development.[3]

Objective (d) of Chapter 39 discusses the relation between trade and the environment. In situations when restrictions to trade are necessary in order to achieve environmental objectives, certain principles and rules should apply such as non-discrimination and transparency. The chosen policy measures should be the least trade-restrictive possible.

Implementation

International environmental law is among the fastest growing fields of international law. The exact number of multilateral environmental agreements (MEAs) depends on the definition and counting method, but UNEP identifies more than 500 international treaties and other agreements related to the environment, of which 323 are regional.[4]Other assessments indicate that there are even more. A big portion of the MEAs have been negotiated and adopted since 1992 and place the environment in the context of a wider development agenda. UNCED spurred a busy negotiating schedule that produced a large number of multilateral environmental agreements, including among others the so-called Rio Conventions – the United Nations Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (CBD), and

[1]UNEP (2007). *Negotiating and Implementing Multilateral Environmental Agreements (MEAs): A Manual for NGOs.* http://www.unep.org/dec/docs/MEAs%20Final.pdf
[2]Engfeldt, Lars-Göran (2009). *From Stockholm to Johannesburg and Beyond. The evolution of the international system for sustainable development governance and its implications.* The Government Offices of Sweden; Sands, Philippe (2003). *Principles of International Environmental Law.* 2nd Edition. Cambridge University Presshttp://books.google.com/books?id=2N5gR1UYT3YC&dq=isbn:0521521068
[3]Engfeldt (2009).
[4]UNEP (2011). *Environment in the UN System. Information Note by the Executive Director.*UNEP/GC.26/INF/23. http://www.environmentalgovernance.org/wp-content/uploads/2011/03/Environment-in-the-United-Nations-system.pdf

the United Nations Convention to Combat Desertification (UNCCD). They have all been carefully negotiated to balance the interests of different parties.[5]

A simple search on "sustainable development" in the ECOLEX database, the most comprehensive source of information on environmental law globally, recognizes close to 100 international treaties, 700 legislations and 50 court decisions with the term included.[6]

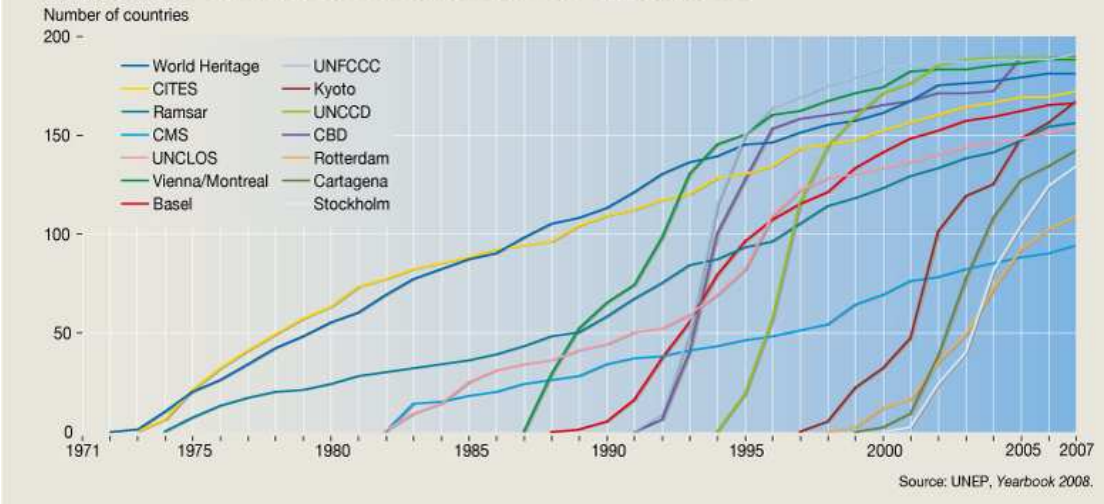

Figure 1. Ratification of multilateral environmental agreements
Source: Riccardo Pravettoni, UNEP/GRID-Arendal.

Chapter 39 includes four specific Activities that are addressed individually below.

Review, assessment and fields of action in international law for sustainable development
The Commission on Sustainable Development (CSD) is designed to carry out a regular assessment of progress and gaps in implementation of globally agreed goals for sustainable development. Chapter 39 was reviewed in CSD-2 and CSD-4 in addition to Rio+5 and the Johannesburg Summit. Beyond 2003 the CSD follows a multi-year programme of work with seven two-year cycles, where the first year is a review session and the second a policy session. CSD-12, 14, 16 and 18 are the review sessions that have been held so far with different issue areas within sustainable development.[7] Information for the performance review is gathered primarily through self-reporting by nations on how well they are addressing the relevant issue areas. This is sometimes criticized as to providing an incomplete or misleading picture since member states want to appear in as good a light as possible. Still the CSD reviews have provided some useful information on the state of sustainable development implementation around the world.

Many Multilateral Environmental Agreements have some sort of reporting requirements, demanding their parties to report on their national performance towards the agreed goals. There is often a template or other guidelines providing the format for the report. A few MEAs provide supplementary third-party verification or monitoring.[8]

[5]UNGA (1997). *Programme for the Further Implementation of Agenda 21.* S/19-2.
http://www.un.org/documents/ga/res/spec/aress19-2.htm
[6]Ecolex July 2011http://www.ecolex.org/
[7]http://www.un.org/esa/dsd/csd/csd_multyearprogwork.shtml
[8]UNEP (2006). *Compliance Mechanisms Under Selected Multilateral Environmental Agreements.*
http://www.unep.org/dec/docs/Compliance%20mechanisms%20under%20selected%20MEAs.pdf

When it comes to fields of action, Paragraph 39.6 addresses the critical situation for the environment in the context of armed conflict. This goes in line with Principle 24 under the Rio Declaration stating 'States shall … respect international law providing protection for the environment in times of armed conflict and cooperate in its further development'.[9]

Paragraph 39.7 stresses the importance of adopting a nuclear safety convention in order to ensure safe and environmentally sound nuclear power. The Convention on Nuclear Safety (CNS) was adopted in Vienna in 1994 and entered into force in 1996. In late 2010 it had 72 Contracting Parties, including all countries with nuclear power plants in operation, and an additional 11 countries have signed but not yet ratified the convention. The 5th Review Meeting of the CNS took place in April 2011 in Vienna to discuss long-term safety issues. Inevitably, the recent accident in Japan got quite some focus, and it was agreed that CNS will hold an extraordinary session in 2012 to analyze the Fukushima events.[10]

Implementation mechanisms

Paragraph 39.8 (b) tasked UNEP and others to contribute to further development of implementation mechanisms. UNEP has undertaken several activities to strengthen the rule of environmental law and to promote the implementation of multilateral environmental agreements.[11] In May 2000, the Malmö Declaration was adopted which stressed that a more coherent and coordinated approach must be taken among international environmental instruments, including in environmental compliance.[12] The UNEP Governing Council in 2001 adopted a Programme for the Development and Periodic Review of Environmental Law for the 21st Century (Montevideo Programme III)[13], followed by an adoption of Guidelines on Compliance with and Enforcement of Multilateral Environmental Agreements.[14]

In the effort to clarify the relationship between MEAs and trade rules, trade-related mechanisms included in several MEAs have been examined. These include the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, the Cartagena Protocol on Biosafety, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Montreal Protocol on Substances that Deplete the Ozone Layer, the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, and the Stockholm Convention on Persistent Organic Pollutants.[15] The Doha Ministerial Declaration from the 2001 WTO Conference emphasizes the need for regular information exchange between institutions on environment and trade.

Effective participation in international law making

In order to ensure equitable opportunities for all countries to contribute and have a say in international law making in the field of sustainable development, Agenda 21 aimed to ensure

[9]Rio Declaration http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm
[10]http://www-ns.iaea.org/conventions/nuclear-safety.asp
[11]Ognibene, Lara (2011). *UNEP's Efforts to Support Compliance with and Enforcement of MEAs.* IISD Reporting Services MEA Bulletin, Guest Article No. 108a, Friday 28 January.
http://www.iisd.ca/mea-l/guestarticle108a.html
[12]UNEP (2000). *Malmö Ministerial Declaration.* http://www.unep.org/malmo/malmo_ministerial.htm
[13]UNEP (2001). *Programme for the Development and Periodic Review of Environmental Law for the 21st Century*. Montevideo Programme III.
http://www.unep.org/law/PDF/GC22_2_3_add2_Montevideo%20III.pdf
[14]UNEP Governing Council 2006; Kaniaru, Donald. *UNEP Governing Council Adopts Guidelines on Compliance with and Enforcement of Multilateral Environmnetal Agreements.* Paper for the Sixth International Conference on Environmental Compliance and Enforcement.
http://www.inece.org/conf/proceedings2/9-UNEP%20Gov%20Council.pdf
[15]UNEP (2007) Trade-related Measures and Multilateral Environmental Agreements
http://www.unep.ch/etb/areas/pdf/MEA%20Papers/TradeRelated_MeasuresPaper.pdf

technical and financial assistance to developing countries in particular. Many MEAs and soft law meetings today help provide funding to delegates from developing countries to attend negotiations. This has provided for more balanced participation, but there are still inequalities in that wealthy countries can send big delegations and cover all negotiations while this is a challenge for developing countries.

The UNEP Division of Environmental Law and Conventions (DELC) is one agency that provides training, capacity-building and legal assistance to developing countries and others who need it.[16] One example is that since 2004, UNEP in collaboration with the University of Eastern Finland (UEF) has organized annual courses on Multilateral Environmental Agreements. The two-week high profile courses bring together past, current and future negotiators to transfer experiences in regard to international environmental law-making and diplomacy.[17] The United Nations Institute for Training and Research (UNITAR) has an International Law Programme (ILP) with tailor-made training for member states and distance learning on international environmental law. Since 2007 they offer popular e-learning courses on international environmental law, now starting twice a year and with training available in Spanish as well as English.[18] In addition to training courses, several UN agencies and NGOs have developed and distributed guides and other published materials to support learning and capacity of policy makers.

Once an agreement has been put in place at the international level, developing countries and others often need support in their national efforts to integrate the global goals into national legislation and ensure implementation international agreements. It is often up to them to identify what kind of capacity they are in need of, and support is then given based on requests.

In addition to participation of member states, Agenda 21 brought new procedural challenges to the system through the call for multiple stakeholder participation in sustainable development.[19] Principle 10 of the Rio Declaration introduces accountability, transparency and democratic empowerment into decision-making on environmental matters. The 1998 Aarhus Convention is an example of a regional mechanism for implementation of Principle 10.[20]

Disputes in the field of sustainable development

Conflict is avoided but accepted as a given by-product when it comes to rule and law enforcement, and it was necessary for Agenda 21 to address how to deal preventatively with disputes that will arise in the legal sustainable development arena. Putting dispute settlement mechanisms into operation can be important for ensuring better implementation. Mediation, conciliation, panels and other elements can be useful in such mechanisms.

The World Trade Organization (WTO) has a dispute settlement body, and it is possible to bring issues regarding environment and trade to that body. The Committee on Trade and Environment under WTO seeks to identify potential disputes and propose solutions.[21] Some Multilateral Environmental Agreements have existing dispute settlement and compliance mechanisms as well.

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[16] http://www.unep.org/DEC/About/index.asp
[17] http://www.uef.fi/unep
[18] http://www.unitar.org/ilp/distance-and-e-learning/basic-course-in-international-environmental-law
[19] Kanie, Norichika (2007). *Governance with Multilateral Environmental Agreements: A Healthy or Ill-Equipped Fragmentation?* In Swart, Lydia and Perry, Estelle (ed.) Global Environmental Governance – Perspectives on the Current Debate. http://www.earthsystemgovernance.org/publication/kanie-norichika-governance-meas
[20] Stoddart, Hannah (ed.) (2011). *A Pocket Guide to Sustainable Development Governance.* First Edition, Stakeholder Forum Commonwealth Secretariat. http://www.uncsd2012.org/rio20/index.php?page=view&type=400&nr=27&menu=45
[21] http://www.wto.org/english/tratop_e/envir_e/envir_e.htm

For example, the UN Framework Convention on Climate Change (UNFCCC) has a compliance committee. Croatia was subject to investigation in 2009.[22]

While a variety of MEA dispute mechanisms are in existence, and international and regional courts and tribunals as well, there is no international dispute resolution mechanism purely for environmental or sustainable development issues with compulsory jurisdiction and where entities other than states can have a standing.[23]

Challenges and Conflicts

Political Barriers

The Malmö Declaration in 2000 brought the attention to an 'alarming gap between commitments and actions', and this is still true today.[24] The implementation gap is a symptom of deeper root causes, such as competing paradigms. A short-term economic paradigm and trends towards economic globalization have made it more difficult to follow up the goals agreed in Agenda 21.[25]

It is problematic that many definitions and indicators of sustainable development have been developed, but that there is no agreement/common global metric on how to measure sustainable development. Without clear metrics for measuring progress, the goal of sustainability remains elusive since every actor can push the meaning to in a suitable direction for their own interests.[26]

Conflicting Provisions of International Law

International law has some inherent contradictions. The most glaring area is global trade, with rules governed by the WTO that often make it difficult for states to institute trade barriers based on environmental norms. There are also inherent contradictions in the simultaneous upholding of the principle of national sovereignty alongside the recognition that national actions can have international impacts.

Lack of Enforcement

Most sustainable development and environmental treaties are 'soft law' norms. This means that in opposition to the legally binding 'hard law' instruments, they are non-binding and difficult to institutionalize and enforce. MEAs that conform to the Vienna Convention on the Law of Treaties are considered hard law while the others are soft. Both approaches can be useful in different ways, but the lack of enforcement is problematic. Soft-law agreements can be important for influencing international and national policy, but there is no guarantee that decisions will be pursued. Even when it comes to hard law, the consequences to not complying with international environmental legislation are few. There is a lack of legal redress at the international level.[27]

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[22] http://unfccc.int/files/kyoto_protocol/compliance/enforcement_branch/application/pdf/cc-2009-1-3_croatia_eb_decision_on_expert_advice-final_24_sept_09.pdf

[23] Sitaraman, S (2009). *Review of International Courts and Environmental Protection.* The Review of International Organizations. Vol 4, Issue 3, p 319-324.

[24] UNEP 2011. Environment in the UN System.

[25] Engfeldt, Lars-Göran (2009). *From Stockholm to Johannesburg and Beyond. The evolution of the international system for sustainable development governance and its implications.* The Government Offices of Sweden

[26] Faber, N. et al. (2005). *The Sustainability of "Sustainability" – A Study into the Conceptual Foundation of the Notion of Sustainability.* Journal of Environmental Assessment Policy and Management, Vol. 7, No. 1 (March 2005), p 1-33. http://www.sustainableorganizations.org/Sustainability-of-Sustainability.pdf

[27] UNEP (2007). *Negotiating and Implementing Multilateral Environmental Agreements (MEAs): A Manual for NGOs.* http://www.unep.org/dec/docs/MEAs%20Final.pdf

Proliferation and Fragmentation

The number of treaties has grown with an impressive speed in the sustainable development domain, which is indeed a major achievement, but not necessarily exclusively positive. An increasing quantity of legal instruments is not enough, but what really counts is how well the treaties help improve sustainability through real outcomes. A vast amount of implementation is needed before a law can be considered successful. In many cases it may be too early to expect visible results on the ground, but on the system level the legal landscape has become more complex than before. The trend has been for each new agreement to establish a new secretariat and independent bureaucracy, and the proliferation of treaties has fragmented the authority of international environmental institutions.[28]

Negotiation Burden

The proliferation of MEAs has also caused a challenge in that the number of meeting days has increased considerably. The intense negotiation schedule is a burden particularly for developing countries with limited financial and human capacity to cover all the meetings. Some have described the result as negotiation fatigue.[29]

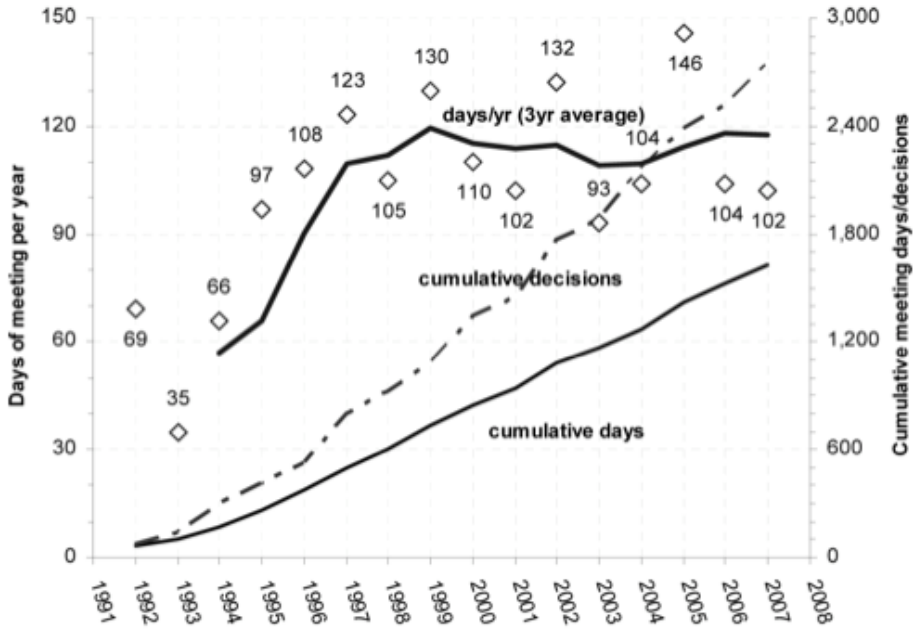

Figure 2. Leading MEA meeting days and decisions 1992–2007
Source: MIT Press, Muñoz *et al*.

Lack of Accountability

Global environmental and sustainable development governance suffers from a culture of unaccountability. This problem applies both in regards to accountability to mandate, institutional accountability and accountability to constituency. The system is populated by negotiators who are often rather disconnected from the realities faced by implementers on the ground. There is an absence of legal provisions on a national level for people to have access to information,

[28]Miquel Muñoz, Rachel Thrasher and Adil Najam. *Measuring the Negotiation Burden of Multilateral Environmental Agreements.* Global Environmental Politics, MIT Press.
http://www.mitpressjournals.org/doi/pdf/10.1162/glep.2009.9.4.1
[29] Ibid.

participation and access to justice. This represents a barrier to citizens holding their governments to account for implementing international agreements.[30]

Way Forward

Environmental change poses serious risk to human well-being and survival. It is crucial for the future to find better ways to manage this and solve the crises. A focus on ecosystem services and human well-being makes it clear that enforcement of environmental law is not at the expense of the social and economic pillars of sustainable development, but in support of it.
Whilst implementation on a national level will remain the most important vehicle for advancing progress towards globally agreed goals on sustainable development, institutional changes will be needed on a global level to create a more effective, efficient and streamlined enabling environment. A number of options which could promote progress in this area are outlined below:

Clustering Multilateral Environmental Agreements
Greater coherence in international environmental and sustainable development law could be achieved by clustering of MEAs. Clustering refers to the combining, integration or merging of several agreements to increase their efficiency and effectiveness. Clustering could be done by common organizational bodies, by issue, by common functions, by regions, or by joint meetings of the heads of the scientific and technical committees within a cluster.[31]

Some efforts to cluster MEAs already exist, such as in the Chemicals regime where the Basel, Rotterdam and Stockholm Conventions have started a process for working more closely together and merging some functions. Another good example is the Multilateral Environmental Agreements Information and Knowledge Management Initiative (MEA IKM) set up by UNEP in 2009, in which 17 Multilateral Environmental Agreements (MEAs) are participating. Its webportal *InforMEA* launched in 2011 allows draws information directly from the MEA websites and databases and displays for easy overview and comparison in one single location.[32] The recent International Environmental Governance Reform Process and its Nairobi-Helsinki Outcome identified MEA clustering as a major priority.[33]

National Reporting
Most MEAs require Parties to report on the measures they have taken towards implementation. National reporting is important for accountability, and it needs to be streamlined in order to be more useful. There has been a growing recognition that reporting is often complex and puts a burden on the national level since governments need to prepare multiple comprehensive reports. Options for harmonizing national reporting to biodiversity-related agreements have been looked at, and this could be improved in many more issue areas.[34] A possibility would be to have a common reporting template where nation states would report on adherence to all MEAs.

Access to Information (Principle 10)
It is important to implement Principle 10 from the Rio Declaration, which states that environmental issues are best handled when all concerned citizens have the opportunity to

[30]BU Pardee Center, Global Environmental Governace: The Challenge of Accountability
http://www.bu.edu/pardee/files/2010/04/UNsdkp005fsingle.pdf
[31]Stoddart, Hannah (ed.) (2011). *A Pocket Guide to Sustainable Development Governance.* First Edition, Stakeholder Forum
Commonwealth Secretariat.
http://www.uncsd2012.org/rio20/index.php?page=view&type=400&nr=27&menu=45
[32]http://informea.org/
[33]Nairobi-Helsinki Outcome
http://www.unep.org/environmentalgovernance/Portals/8/documents/Events/NairobiHelsinkifinaloutcomeedited.pdf
[34]http://www.iisd.ca/mea-l/guestarticle8.htm

participate in decision-making. The World Resource Institute advocates for the establishment of Regional Conventions on Principle 10.[35]

International Court for the Environment

Obligations under international environmental law can be addressed through several international courts and tribunals that exist today, but it is argued that this could be done better through the establishment of an International Court for the Environment (ICE). The proposal has been discussed for some years, as way to improve compliance with MEAs and deliver access to justice for non-state actors. An ICE would provide a mechanism for enforcement and ensure that states adhere to international environmental obligations in the context of sustainable development.[36]

[35]Stoddart, Hannah (ed.) (2011). *A Pocket Guide to Sustainable Development Governance.* First Edition, Stakeholder Forum Commonwealth Secretariat.
http://www.uncsd2012.org/rio20/index.php?page=view&type=400&nr=27&menu=45
[36] Ibid.

Chapter 40: Information for Decision-Making

Introduction

The final chapter of Agenda 21 highlighted the significance of accurate information, data and knowledge for decision-making at the international, national, grassroots and individual levels, pointing out that 'in sustainable development, everyone is a user and provider of information considered in the broad sense'.[1] At the Rio Summit, it was undertaken to (a) bridge the gap in the 'availability, quality, coherence, standardization and accessibility of data', particularly between developed and developing countries, and (b) improve the availability of existing information.[2] 20 years later, success in implementing each programme area has been notable but partial, and the development of a comprehensive framework for data collection and information sharing remains very much a work in progress.

Implementation

Bridging the data gap

In the first place, the sheer scope of Agenda 21 in its outlining of a comprehensive plan of action for environmental protection necessitated a vast expansion of data collection efforts; information was required on a great many newly emphasized areas, including urban air, freshwater, land resources, desertification, soil degradation, biodiversity, the high seas and the upper atmosphere. Moreover, it was noted that developing countries in particular suffered from a lack of institutional capacity for data collection and assessment, causing an imbalance in the availability of information. Somewhat separately, and with the relationship between data availability and effective decision-making very much in mind, the importance of developing an appropriate framework of indicators for sustainable development was highlighted. In order to address these and other concerns, it was undertaken to implement measures in six areas of activity, across which progress can be described as uneven.

Development of indicators of sustainable development

The UN, EU and OECD have each made efforts to develop a systematic framework of indicators of sustainable development. The UN's Commission on Sustainable Development (CSD) approved its Work Programme on Indicators of Sustainable Development in 1995, with the first two sets of CSD Indicators of Sustainable Development developed between 1994 and 2001.[3] Initially, 134 indicators were suggested, and were pilot tested by 22 countries prior to an evaluation and revision of the indicator set from 1999 to 2000. Most countries found that the initial indicator set was too large, and in 2001 a revised set of 58 indicators was presented.[4] In 2006, the expert group finalized the existing set of 50 core indicators, alongside 46 additional indicators intended to permit a 'more comprehensive and differentiated assessment of sustainable development' where data is available.[5] The indicators are grouped into a series of themes and sub-themes, and are designed to allow countries to track progress towards nationally-defined goals.[6]

[1] http://www.un.org/esa/dsd/agenda21/res_agenda21_40.shtml
[2] Ibid.
[3] http://www.un.org/esa/sustdev/natlinfo/indicators/guidelines.pdf, p. 3
[4] Ibid. p. 6
[5] Ibid. pp. 7, 9
[6] Ibid. p. 22

Following the Rio Summit, the EU worked alongside the UN work programme on indicators of sustainable development and published its own indicator sets in 1997 and 2001.[7] A EU-oriented indicator set was proposed following the adoption of the EU Sustainable Development Strategy in 2001, and was endorsed by the European Commission in 2005.[8] Since then, a series of minor revisions have resulted in the existing indicator set, comprising 11 headline indicators across 10 themes, and over 100 indicators in total.[9] The existing set also describes indicators either in development or as yet undeveloped, and the suitability of the indicator set in the context of emerging environmental concerns is constantly reviewed.[10]

The OECD has cooperated with UNCSD, the EU and other international organizations to develop its own environmental indicators.[11] Notably, the OECD has focused on developing multiple sets of indicators, each appropriate to a specific context. The Core Environmental Indicators, designed to track 'environmental progress and performance', comprise about 50 individual indicators; separate indicator sets adapted in part from the core set aim at informing the public, promoting integration and monitoring progress towards sustainable development.[12]

It is also interesting to note the creation in 2008 by the President of the French Republic, Nicholas Sarkozy of the Commission on the Measurement of Economic Performance and Social Progress (CMEPSP), whose aim has been to 'identify the limits of GDP as an indicator of economic performance and social progress, including the problems with its measurement [and] to consider what additional information might be required for the production of more relevant indicators of social progress'.[13] The 2009 Report produced by the Commission recommended that provision be made for 'a well-chosen set of physical indicators' descriptive of 'our proximity to dangerous levels of environmental damage'.[14] It is clear that demand is growing for performance indicators that go beyond GDP in evaluating socioeconomic progress and wellbeing more generally, auguring well for the increased adoption of the sustainable development indicators mentioned.

In targeting the development of indicators of sustainable development, Agenda 21 highlighted the importance of incorporating the use of selected indicators in satellite and ultimately national accounting mechanisms.[15] The System of Integrated Environmental and Economic Accounting (SEEA) developed by the United Nations Statistical Commission with the International Monetary Fund, the World Bank, the European Commission and OECD represents the most significant attempt to integrate national accounting and environmental indicators, aiming at the creation of a system of satellite accounts which express information on environmental sustainability in both monetary and physical terms.[16] Work is currently under way to elevate the SEEA from the 'manual of best practices' published in 2003 to an international accounting standard equivalent to the System of National Accounts (SNA).[17]

The CSD indicators are linked to the SEEA through the adoption of increasingly uniform classifications and definitions, and the inclusion of sectoral breakdowns appropriate to the SEEA's composition.[18] For its part, the OECD has developed a set of indicators tailored

[7] http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-78-09-865/EN/KS-78-09-865-EN.PDF, p. 33
[8] Ibid.
[9] http://epp.eurostat.ec.europa.eu/portal/page/portal/sdi/indicators
[10] http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-78-09-865/EN/KS-78-09-865-EN.PDF, p. 35
[11] http://www.oecd.org/dataoecd/20/40/37551205.pdf, p. 34
[12] Ibid. p. 35
[13] http://www.stiglitz-sen-fitoussi.fr/documents/rapport_anglais.pdf, p. 7
[14] Ibid. pp. 17-8
[15] http://www.un.org/esa/dsd/agenda21/res_agenda21_40.shtml
[16] http://www.un.org/esa/sustdev/natlinfo/indicators/guidelines.pdf, pp. 41-2
[17] http://unstats.un.org/unsd/envaccounting/Brochure.pdf, p. 1
[18] http://www.un.org/esa/sustdev/natlinfo/indicators/guidelines.pdf, p. 42

specifically to the integration of environmental concerns and national accounts, emphasizing 'environmental expenditure accounts; physical natural resource accounts related to sustainable management of natural resources; and physical material flow accounts, related to the efficiency and productivity of material resource use'.[19] It should therefore be clear that meaningful progress has been made in meeting this objective.

Improvement of data collection, assessment and analysis

Phase I of the Global Assessment of Environment Statistics and Environmental-Economic Accounting undertaken by the United Nations Statistics Division (UNSD) between 2006 and 2007 found 91 per cent of responding countries to have an environment statistics programme, and 70 per cent were planning to expand their programme.[20] Moreover, about half of responding countries had an environmental-economic accounting programme, and a further 20 were planning to implement accounting measures in the near future.[21] More specifically, environmental-economic accounting programmes were found to exist in 84 per cent of developed economies, 34 per cent of developing economies and 27 per cent of economies in transition.[22] The six areas most commonly covered were found to include, in order of importance, water, air, forests, land, energy, and agriculture. Water statistics remained the most commonly compiled subject area in both developed and developing countries.[23] However, what is not reflected in these statistics is the quality and reliability of data collected. In the compilation of environmental accounts, the availability and quality of data were considered key impeding factors, while the lack of human and financial resources was identified as the key impeding factors in the collection of data itself.[24]

With this in mind, the CSD indicators have been developed to draw upon data 'routinely collected either by national statistical services or through international processes, for example through the routine work of United Nations specialized agencies or in the MDG context', while data contained in national accounts is also emphasized.[25] Yet for all the efforts made to adapt the exigencies of indicator frameworks to statistical realities, enhancing countries' institutional capacity to collect and assess data remains a priority.

The work programme of the United Nations Committee of Experts on Environmental-Economic Accounting represents a concurrent attempt to lend a new coherence to environmental data collection through the revision of SEEA, from which the FDES 'will benefit in having a well-established environmental-economic accounting system through which many of its concepts can be expressed in official statistics'.[26] It is expected that Volume 1 of the revised SEEA, comprising a revised statistical standard incorporating improvements in 21 areas, will be ready for adoption by the Statistical Commission in February 2012.[27] The Committee is trying to ensure that SEEA 'is recognized as the monitoring and evaluation framework for various policy frameworks', although there are concerns that it is not as well understood as other statistical standards.[28]

The *International Recommendations for Water Statistics* (IRWS), published by UNSD in 2010, seeks in part to facilitate the widespread adoption of the *System of Environmental-Economic Accounting for Water* (SEEA-Water), an SEEA subsystem.[29] More generally, IRWS represents an attempt to 'assist all countries in the establishment and strengthening of a multipurpose

[19] http://www.oecd.org/dataoecd/20/40/37551205.pdf, p. 35
[20] http://unstats.un.org/unsd/statcom/doc07/Analysis_SC.pdf, pp. 1-2
[21] Ibid. p. 2
[22] Ibid. p. 3
[23] Ibid. p. 6
[24] Ibid. p. 2
[25] http://www.un.org/esa/sustdev/natlinfo/indicators/guidelines.pdf, p. 31
[26] Ibid. p. 7
[27] http://unstats.un.org/unsd/statcom/doc11/2011-7-UNCEEA-e.pdf, p. 6
[28] Ibid. pp. 7,8
[29] http://unstats.un.org/unsd/envaccounting/irws/irwswebversion.pdf, p. 10

information system for water in support of integrated water resources management' (IWRM), consolidating 'the experiences and practices of country and international organizations into a set of recommendations for water statistics'.[30] The intention is to provide a coherent, overarching framework to efforts to monitor progress towards IWRM objectives, particularly through the compilation of 'water accounts' that furnish policy makers with an 'integrated information system for understanding water resources, how they are used, and the benefits and costs of this use'.[31] Yet several areas of water statistics are not included, including water quality, environmental flows, water rights, and water incorporated into products; work to remedy these omissions is ongoing, for example in attempts by UNEP to provide guidance on water quality statistics.[32] Crucially, the UN FDES Expert Group has recommended that UNSD establish a core set of environment statistics to assist countries that are only beginning to develop environmental data, and are in no position to implement SEEA.[33]

According to the Global Assessment of Environment Statistics and Environmental-Economic Accounting, the most common application of environment statistics is in the derivation of indicators, carried out by 91% of respondents, followed by modelling and economic analysis (51%). 88% of respondents were found to report environment statistics to international/regional organizations such as Eurostat, the OECD and the UN.[34] As made clear above, sustainable development indicator frameworks have sought to balance international and national exigencies, facilitating global assessment and analysis without compromising the capacity of countries to carry out national assessments. SEEA represents a further framework in which an integrated, globally coordinated programme of assessment and analysis can take place.

Establishment of a comprehensive information framework

Agenda 21 called for greater integration of environmental statistics with information about development more generally, at both national and international levels.[35] However, it is only recently that the clear consensus around the importance of integration has coalesced into something approaching concrete action, and real progress is thin on the ground. Central to the revision of the UN FDES Expert Group has been an attempt to define the 'scope and boundaries' of the links between environment and development statistics; the revised framework is to 'provide the conceptual foundation for better data integration within the environment statistics domain and with other economic and social domains'.[36] At the Second Meeting of the Expert Group in May 2011, it was recognised that the FDES should incorporate information on socioeconomic impacts, for example in the fields of human health and the environment, the impact of resource depletion on prices, and environmental governance.[37] Concurrently, the IWRS makes provision for the future investigation of the links between water data and social-demographic statistics and other statistical fields, pointing out that further work is necessary to 'include more of the social and demographic aspects of water, and in particular those relating to gender and health'.[38]

Strengthening of the capacity for traditional information

[30] Ibid. p. iii
[31] Ibid. p. 10
[32] Ibid. p. 9
[33] http://unstats.un.org/unsd/statcom/doc10/2010-9-Framework-EnvStats-E.pdf, p. 7
[34] http://unstats.un.org/unsd/statcom/doc07/Analysis_SC.pdf, p. 11
[35] http://www.un.org/esa/dsd/agenda21/res_agenda21_40.shtml
[36] http://unstats.un.org/unsd/statcom/doc10/2010-9-Framework-EnvStats-E.pdf, p. 6
[37] http://unstats.un.org/unsd/ENVIRONMENT/fdes/EGM2/EGM-FDES.2.3%20-%20FinalReport.pdf, p. 6
[38] http://unstats.un.org/unsd/envaccounting/irws/irwswebversion.pdf, p. 5

In Rio, the incorporation of local, traditional and indigenous knowledge into information frameworks was recognized as a priority.[39] Particularly significant in this context is article 8 (j) of the Convention on Biological Diversity signed at the summit, which called for countries to 'respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles' relevant for biodiversity, and promote the application of traditional information in wider contexts whilst sharing equitably its benefits.[40] In this instance, traditional information was recognized as essential to the protection of biodiversity, necessitating institutional measures that would protect traditional and indigenous knowledge while directly exploiting its usefulness. Since its first meeting in 2000, the Working Group on Article 8(j) has taken several steps in this direction, including through 'the development of guidelines for the conduct of cultural, environmental and social impact assessments' (the Akwé:Kon Voluntary Guidelines), and 'the development of the elements of an ethical code of conduct to ensure respect for the cultural and intellectual heritage of indigenous and local communities'.[41]

Separately, the International Expert Meeting on Information for Decision Making and Participation held in Canada in 2000 recommended that indigenous and local communities receive funding to manage traditional knowledge more effectively, and carry out research that follows ethical guidelines of their own creation; that 'institutional and legal structures for the application of traditional knowledge to sustainable resource and community management' be developed; and that ecological indicators incorporating local knowledge on issues such as 'species number, migration patterns, changes in weather and vegetation' be utilized.[42] In 2005, the International Technical Workshop on Indigenous Traditional Knowledge, convened in Panama by the Inter-Agency Support Group on Indigenous Issues (IASG) highlighted the importance of promoting a 'a collaborative, complementary and holistic approach' to the protection of traditional knowledge, recognized as both central to identity and self-determination and as a source of the world's cultural and biological diversity in its own right.[43]

Improving availability of information

Agenda 21 recognized that while a wealth of information about sustainable development was available, it was often difficult to find the required information promptly and at an appropriate level of aggregation.[44] Moreover, it was understood that in many countries data was not accessible even where available, due to a lack of technology or associated costs.[45] It was therefore undertaken to strengthen national and international mechanisms of information processing and exchange; enhance national capacities for information handling and communication; and ensure the participation of developing countries in UN data collection and analysis programmes.[46]

Production of information usable for decision-making

Issue- or theme-based frameworks are the most common application of information about sustainable development, particularly in official national indicator sets; most countries that have developed indicator sets have structured them thematically.[47] The advantage of thematic frameworks is that data can easily be linked to policy objectives, and flexibly adapted to

[39] http://www.un.org/esa/dsd/agenda21/res_agenda21_40.shtml
[40] http://www.cbd.int/convention/articles/?a=cbd-08
[41] http://www.cbd.int/traditional/outcomes.shtml
[42] http://www.un.org/esa/sustdev/csd/iem-info-report.pdf, p. 10
[43] http://www.wipo.int/edocs/mdocs/tk/en/wipo_grtkf_ic_9/wipo_grtkf_ic_9_inf_10.pdf, p. 5
[44] http://www.un.org/esa/dsd/agenda21/res_agenda21_40.shtml
[45] Ibid.
[46] Ibid.
[47] http://www.un.org/esa/sustdev/natlinfo/indicators/guidelines.pdf, p. 40

emerging challenges.[48] Such frameworks provide 'a clear and direct message to decision-makers and [facilitate] both communicating with and raising the awareness of the public'.[49] An example of a thematic indicator framework aimed at the public are the OECD's Key Environmental Indicators, which have been developed specifically for communication purposes.[50]

An alternative approach to the application of information about sustainable development is represented by the capitals approach, which 'attempts to calculate national wealth as a function of the sum of and interaction among different kinds of capital, including not only financial capital and produced capital goods, but also natural, human, social and institutional capital'.[51] Central to this approach is the idea of substitutability, which dictates that different forms of natural capital can be equated and freely interchanged according to a measure of monetary value.[52] However, the Stiglitz Report highlighted the difficulty in assigning a monetary value to all environmental goods, and advocated the inclusion of physical environment indicators in national accounts.[53] Nevertheless, capital frameworks are expected to play a significant role in sustainable development decision-making, and work in this area is ongoing.[54]

Aggregated indicators represent a further attempt to produce information about sustainable development appropriate to decision-making, and are often employed as a tool to raise public awareness.[55] Examples include the Ecological Footprint, the Environmental Sustainability Index (ESI) and the Environmental Performance Index (EPI), which emphasize resource consumption, waste and other environmental measures.[56] More comprehensive aggregated indicators include the Adjusted Net Saving, developed by the World Bank to adjust traditional net savings derived from national accounts according to resource depletion and damage caused by air pollution, and the Genuine Progress Indicator (GPI), developed by Redefining Progress to modify GDP according to new measures of well-being.[57] While aggregated indicators face challenges 'related to data availability, methodologies, selection of variables and […] weighing of the variables', they represent a significant opportunity to provide decision-makers and civil society with an easily understood message.[58]

Finally, it is worth highlighting Eurostat's approach to the evaluation of data in its monitoring of progress towards the EU's sustainable development objectives. Four grade categories, represented visually by weather icons, indicate progress over recent years for a given indicator, from clearly favourable to clearly unfavourable.[59] While such an approach is acknowledged as by no means perfect, it allows for a clear message to be communicated to decision-makers.

Establishment of standards and methods for handling information

The Compendium of Environmental Data published by the OECD functions to harmonize information about the environment at the international level, and provides the basic data sets for OECD indicator programmes.[60] The data included in the Compendium is the product of SIREN (OECD System of Information on Resources and the Environment), a global scheme of data

[48] Ibid.
[49] Ibid.
[50] http://www.oecd.org/dataoecd/20/40/37551205.pdf, p. 35
[51] Ibid.
[52] Ibid. p. 41
[53] http://www.stiglitz-sen-fitoussi.fr/documents/rapport_anglais.pdf, p. 79
[54] http://www.un.org/esa/sustdev/natlinfo/indicators/guidelines.pdf, p. 41
[55] Ibid. p. 43
[56] Ibid.
[57] Ibid. pp. 43-4
[58] Ibid. p. 44
[59] http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/865-EN/EN/865-EN-EN.PDF, p. 25
[60] http://www.oecd.org/dataoecd/22/14/41877753.pdf, p. 6

collection on resources and the environment.[61] However, a key difficulty is that classifications, definitions and measurement methods vary from one country to another, rendering inter-country comparison potentially problematic.[62] For this reason, work carried out in the implementation of the OECD's Collaborative Plan of Action on Environmental Data Quality currently focuses upon 'coherence among countries', in an attempt to facilitate global harmonization.[63]

Central to the ongoing development of the FDES is the attempt to generate 'a set of consistent definitions, classifications, variables, tabulations and indicators', and thereby facilitate the harmonized exchange of data.[64] Connectively, the IWRS represents an attempt to determine the statistical units of the environment for water and how they should be measured.[65] The manner in which spatial and temporal information should be included is also specified.[66]

Establishment and strengthening of electronic networking capabilities

It is fair to say that Agenda 21 could not have anticipated the future role of the internet in information sharing, and it goes without saying that implementation in this activity area has been successful. The internet is central to the collection and sharing of information about sustainable development and the environment, and data collected through the coordinated efforts of UNSD, Eurostat and the OECD is easily accessible to decision-makers online.

Challenges and Conflicts

Lack of capacity at the national level

Problems with data availability and reliability represent the biggest challenge to the widespread employment of indicators of sustainable development, and despite progress made over the last decade the data gap identified by Agenda 21 remains a concern.[67] The United Nations Statistics Division (UNSD)/United Nations Environment Programme (UNEP) Questionnaire on Environment Statistics, covering the areas of water, air, land and waste, illustrates the scale of the problem; while the number of respondents has increased since 1999, 'many countries still have only scattered data and are able to reply only on a limited number of variables'.[68]

The UNSD has undertaken several capacity building programmes to remedy the lack of data availability and reliability in the developing world, among them the project 'Strengthening Statistical Capacity-building in Support of the Millennium Development Goals in the region of the Economic Community of West African States (ECOWAS)' realized in collaboration with the ECOWAS Secretariat, the Economic Commission for Africa (ECA), the Division for Public Administration and Development of the United Nations Department of Economic and Social Affairs (DESA), and UNEP. Subsequently to a Workshop on Environment Statistics held in Senegal in 2005, an assessment of 15 countries belonging to the region revealed 'substantial data gaps [concerning] all subfields of environment statistics', noting that 'little institutional capacity and missing financial resources in the relevant governmental bodies affect considerably the scope and quality of data collection activities'.[69]

[61] Ibid. p. 7
[62] Ibid. p. 8
[63] http://www.oecd.org/dataoecd/23/47/44427761.pdf, p. 33
[64] http://unstats.un.org/unsd/statcom/doc10/2010-9-Framework-EnvStats-E.pdf, p. 3
[65] http://unstats.un.org/unsd/envaccounting/irws/irwswebversion.pdf, p. 51
[66] Ibid. p. 52
[67] http://www.un.org/esa/sustdev/natlinfo/indicators/guidelines.pdf, p. 31
[68] http://unstats.un.org/unsd/ENVIRONMENT/envpdf/Brochures/BrochureEnvironment.pdf, p. 1
[69] http://unstats.un.org/unsd/ENVIRONMENT/envpdf/Assessment_report_ECOWAS_March2006.pdf, pp. 8-9

Connectively, an assessment carried out in 2002 as part of the UNSD programme 'Strengthening Statistical Capacity in the region of the Economic and Social Commission for Western Asia (ESCWA)' found that environment statistics in the region are 'rarely generated or disclosed', and that 'only Jordan and Palestine have a suitable infrastructure for environment statistics and Syria, Kuwait, Egypt, Bahrain and Lebanon have it to a lesser extent'.[70] Environmental data collection is largely carried out incoherently and lacks a unifying methodological framework, leading to a deficit in data availability and reliability.[71]

Balancing national and international contingencies

Global indicator frameworks, in seeking to harmonize environmental data sets at the international level, risk distorting the picture decision-makers have of the situation at the national and local levels. The CSD Work Programme recognized that any successful national programme would have to adapt the CSD framework and core indicators to its own circumstances, and the attempt to harmonize the use of indicators at the global level should be viewed in this context.[72] The indicator frameworks developed by UNCSD, the EU and the OECD each attempt to resolve the conflict between contextual, national contingencies and international harmonization by matching 'core' or 'headline' indicators to more complex and differentiated sets of supplementary indicators. The Guidelines to the present set of CSD indicators note that 'indicators that are not part of the core are either relevant only for a smaller set of countries, provide complementary information to core indicators or are not easily available for most countries'; a reduced set of core indicators is to allow for national variations in data availability, whilst emphasizing areas of chief global concern.[73]

Connectively, the most recent revision of the CSD indicators placed special emphasis on the role of inter-agency collaboration in order to ensure coherence with alternative indicator sets such as the MDG Indicators, the 2010 Biodiversity Indicators Partnership, the Hyogo Framework for Action on Disaster Reduction, the Global Forest Resource Assessment, and Sustainable Tourism Indicators.[74] Integration with the MDG Indicators was of particular concern, to the extent that a 'concurrent review of the MDG Indicators lead to the inclusion of selected CSD indicators into the revised MDG framework, especially in the areas of natural resources, biodiversity and employment'.[75] Therefore, while the CSD indicators are designed primarily to assist in measuring progress at the national level, work to facilitate their application at the global level is ongoing.

Protecting traditional knowledge

Attempts to create an integrative, global information system run the risk of compromising traditional and indigenous knowledge by imposing alien, 'universal' cultural norms on traditional societies. The 2005 International Technical Workshop on Indigenous Traditional Knowledge referred to above recognized a range of threats to traditional knowledge, including cultural assimilation, loss of links to traditional territories, destruction of ecosystems and an absence of coherent national policies protective of indigenous peoples and knowledge.[76] In seeking to build the capacity of developing countries to contribute data to global environmental information systems, attention needs to be paid to the local, culturally contingent knowledge already firmly embedded in traditional societies.

[70] http://unstats.un.org/unsd/ENVIRONMENT/envpdf/escwaassessfinal2005.pdf, p. 4
[71] Ibid.
[72] http://www.un.org/esa/sustdev/publications/indisd-mg2001.pdf, p. 19
[73] http://www.un.org/esa/sustdev/natlinfo/indicators/guidelines.pdf, p. 7
[74] Ibid.
[75] Ibid. p. 22
[76] http://www.wipo.int/edocs/mdocs/tk/en/wipo_grtkf_ic_9/wipo_grtkf_ic_9_inf_10.pdf, p. 10

Way Forward

The ongoing development of the UN Framework for the Development of Environment Statistics (FDES) represents a significant attempt to systematically resolve the problems in data collection and assessment identified at the Rio Summit. Central to the work of the Expert Group assembled as part of the project is the recognition that environment statistics 'frequently lack one or more of the standard attributes of high-quality statistics, namely, relevance, accuracy, timeliness, accessibility, interpretability and coherence'.[77] Given the fact that environment statistics are frequently collected in an ad hoc, unsystematic manner and suffer from wide variances in quality, the Expert Group has undertaken to develop an 'overarching conceptual framework' that links data collection to indicator frameworks and ensures greater coherence.[78] The revised framework could be implemented and submitted to the UN Statistical Commission in 2012.[79]

The ECOWAS programme referred to above seeks to enhance the institutional capacity of countries to collect and assess environmental data by 'sensitizing countries on the importance of environment statistics', 'providing or promoting guidelines, manuals and training material' and 'coordinating activities between countries', among other measures.[80] Connectively, recommendations drawn from the ESCWA programme include establishing legal provisions for 'an agreed concept covering basic environment statistics in each country' and ensuring the allocation of financial resources, coordinating data collection efforts among countries in the region, and providing appropriate training activities.[81] Efforts to augment the capacity of developing countries to collect and assess information on the environment and sustainable development will have to continue if the serious problems noted above are to be overcome.

Fundamentally, the protection of traditional knowledge is contingent upon respect for indigenous rights, including 'rights to territories and resources, collective rights, the application of the principle of non-discrimination, the avoidance of negative cultural policies and racism, the promotion of peace and justice and the right to self-determination, encompassing customary legal systems and the principle of free, prior and informed consent'.[82] It is unlikely that traditional knowledge will be adequately protected unless serious measures are undertaken to alter the relationship of decision-makers at the national and international levels to traditional communities as a whole. For this reason, efforts to develop *sui generis* legal systems in order to meet needs unacknowledged by existing intellectual property and other laws represent a particularly significant component of the broad attempt to institutionally cement the importance of traditional knowledge, and exploit its potential.[83] Significant also is the future participation of indigenous communities in the development of national traditional knowledge policies, as in the case of the First Nations of Canada.[84]

[77] http://unstats.un.org/unsd/statcom/doc10/2010-9-Framework-EnvStats-E.pdf, p. 3
[78] Ibid. p. 6
[79] Ibid. p. 9
[80] http://unstats.un.org/unsd/ENVIRONMENT/envpdf/Assessment_report_ECOWAS_March2006.pdf, p. 5
[81] http://unstats.un.org/unsd/ENVIRONMENT/envpdf/escwaassessfinal2005.pdf, p. 11
[82] http://www.wipo.int/edocs/mdocs/tk/en/wipo_grtkf_ic_9/wipo_grtkf_ic_9_inf_10.pdf, p. 10
[83] Ibid. p. 6
[84] Ibid. p. 7