National Stakeholder Consultations on Water: Supporting the Post-2015 Development Agenda

THE WORLD WE WANT

Global Water Partnership

The Post 2015 Water Thematic Consultation

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About GWP
The Global Water Partnership vision is for a water secure world. Our mission is to support the sustainable development and management of water resources at all levels. The Global Water Partnership is an intergovernmental organisation of 13 Regional Water Partnerships, 84 Country Water Partnerships and more than 2,770 Partner organisations in 167 countries.

Disclaimer
This Report is based on and reflects consultations in selected countries, held from February to May 2013. Its content and recommendations do not necessarily reflect the views and positions of GWP, UNDP, UNECE, the United Nations, the EUWI – Africa Working Group or the Government of Switzerland.

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Abbreviations

EUWI	European Union Water Initiative
GDP	Gross Domestic Product
GWP	Global Water Partnership
IWRM	Integrated Water Resources Management
MDG	Millennium Development Goals
NGO	Non-Government Organisation
SDG	Sustainable Development Goals
THB	Thai Bhat
UN	United Nations
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
WASH	Water Supply, Sanitation and Hygiene
WRM	Water Resources Management

Preface

The UN Secretary General has stressed the importance of responding to the voice of stakeholders in the preparation of a future post-2015 development agenda. As well as numerous expert meetings and UN events, this has led to thematic consultations on the internet and social media (the World We Want 2015). The Global Water Partnership (GWP) has used its extensive network of partnerships to reach out to stakeholders across the world, complementing the online processes with face-to-face meetings, recording the voice of stakeholders *in situ*.

A series of consultations have been organised in 22 countries with a range of stakeholders intimately involved in water and water related sectors. This report gives their voice, in their own words. It is supported by Country Reports that contribute to internal processes within their own countries, as well as informing the global development agenda.

The national consultations demonstrated the considerable importance of water to national development with an overall consensus emerging from the stakeholders consulted. The consultations have also been linked to other regional political processes addressing the future development framework. A clear finding is that now, as compared to 2000, many regions and countries are better prepared to consider water development and management in a more integrated manner.

The response has been impressive, involving about 1,000 participants from different social groups at different levels: government, civil society, academe, private sector, professionals and workers, men and women. An important feature was to include stakeholders from non-water sectors that are water-dependent.

To structure the consultation, discussions were centred on three sub-topics: water resources management; wastewater management and quality; and water supply, sanitation and hygiene. The consultations showed that these categories are closely interlinked and need to be considered jointly in terms of policy and planning.

The stakeholders have given a consistent message to politicians: it is time to move forward on water. The MDGs provided a launching pad and the post-2015 development agenda must build on this. Water, in all its forms and uses, is fundamental to all sustainable development needs and must be managed effectively for the good of all. Human development, economic and social development, poverty reduction and the environment, all depend on water security and that constitutes the rationale for highlighting water in the post-2015 development framework.

Dr. Ursula Schaefer-Preuss
Chair, Global Water Partnership

An arid country

"In those places where, at least, small amounts of water emerge nature blossoms out. Life always arises near water sources: lakes, springs, and temporary water bodies in depressions that accumulate rainwater or water of thawing snow. Here, human beings can find not only water for drinking but also food due to an abundance of various plants and animals near water bodies in the desert areas. Just owing to these facts, the people in Uzbekistan idolize water and glorify it in innumerable legends, stories and parables as the fountain of life and a means for life continuation. Water is identified with life and life is identified with water."

From the Uzbekistan Consultations

Executive summary

The purpose of the national stakeholder consultations on water was to listen to country needs and priorities regarding the post-2015 agenda for water and sustainable development. The consultations aimed to get the voice of stakeholders on water issues to obtain a deeper qualitative understanding of individual country priorities. The country level feedback adds practitioner value to the wider policy dialogues being undertaken by the United Nations and contributes to shaping potential sustainable development goals after 2015.

The consultations were carried out by local Global Water Partnership (GWP) partners in collaboration with government and generally consisted of a one day session chaired by a senior government official. Participants numbered over 1,000 overall with a broad stakeholder representation from government, the private sector, academia and civil society, from water and non-water (water-dependent) interest groups.

Each country consultation discussed priorities in water resources management, water supply and sanitation, wastewater treatment and water quality management. They considered improving both infrastructure and management, establishing monitoring systems for water resources management, and possible national development goals for water.

Water is recognised by countries as a pivotal ingredient for national development, providing food, energy and livelihoods and has the potential to make an even greater contribution to national development in the future. Water is the basis for the well-being of people and the progressive provision of safe drinking water and sanitation. It has been recognised by the UN General Assembly as a human right. The consultations also report water as a medium for destruction and social upheaval with effects across social, economic and environmental dimensions.

A significant observation from the list of priorities arising from the consultations is that achieving improved management of water resources is of extremely high importance across disciplines and segments of society and requires long-term support. Stakeholders identified the integrated approach as a priority for countries, essential for efficient water development, water security and provision of water services. They further recognised that it requires a long-term commitment.

All countries report on-going programmes for water supply and sanitation that have had positive results for all. Stakeholders identified as a priority the continued provision of basic services and expressly stated, in some cases, the objective of full coverage in the coming 20 years. However, most country consultations identify slow progress with sanitation, especially in rural communities. Almost without exception, wastewater was identified by all countries as a future priority with action needed to improve wastewater treatment, encourage recycling and reduce pollution.

Managing water quality emerged as a high priority, but it is linked to the existence of an effective pollution control system. A lack of monitoring systems for water quality and environmental impact, coupled with poor enforcement of controls over polluting discharges (mainly wastewater), make water quality management a challenging issue.

Stakeholders recognise that economic, social and environmental risks from water related events have to be identified and managed as a priority. These may range from localised impacts from natural climate variations to extreme climate events. At one end of the scale this may result in localised, but severe, social disruption and at the other, greatly impact on economic growth, services and livelihoods.

The consultations identified the need for both investing in appropriate infrastructure and in improving water management. The consultations proposed a range of national goals that demonstrate the diversity across countries according to local circumstances and took into account identified threats from increasing urbanisation, population growth, pollution and a more variable climate. Many country consultations highlighted the need for water security and also showed a broad similarity on the following three key needs:

- achieving improved water resources management using an integrated approach with planning based at the system level (usually river basin), founded on a good understanding of available water resources and quality and contributing to water security
- achieving safe and reliable drinking water supplies and sanitation for all people in urban and rural areas with adequate treatment of wastewater to reduce or prevent pollution
- managing risk with operational plans and actions to mitigate impacts of extreme events and climate change.

1 Why hold consultations on water?

The purpose of the national stakeholder consultations on water was to listen to country needs and priorities regarding the post-2015 agenda for water and sustainable development. The consultations were structured to capture the voice of stakeholders on water and obtain a deeper qualitative understanding of individual country priorities. The country level feedback adds practitioner values to the wider policy dialogues being undertaken by the UN and contributes to shaping potential sustainable development goals (SDG) after 2015.

The UN Conference on Sustainable Development in Rio de Janeiro, in June 2012 (Rio+20) triggered a range of consultative exercises both within and external to the UN to consider the post-2015 development framework. The UN Secretary General stressed the importance of having a sound consultation process prior to the 2015 General Assembly. The national consultations on water complement and reinforce other activities, such as the e-discussions and online consultations, as well as surveys and national development consultations undertaken by governments. In particular it strengthens the stakeholder input to governmental processes. Details of the various UN preparatory processes and debates can be found at www.worldwewant2015.org.

Although water is central to development its value is often taken as 'a given' and overlooked. This is no longer viable as water is increasingly critical to all three development dimensions: social, economic and environmental. Water impacts on all aspects of society, such as food, health, energy, etc., as well as risks from disasters and climate change. It is thus essential to recognise the linkages between water and other thematic consultations.

For practical purposes UN-Water defined three core discussion areas for the country consultations:

- water supply, sanitation and hygiene (WASH)
- wastewater treatment, water quality management
- water resources management (WRM).

Clearly there is considerable overlap between these discussion areas while other important issues, such as the environment, were not specifically identified. The results of these consultations will be shared in various forms with the UN Secretary General's High-Level Panel on the Post-2015 Development Agenda, the Open Working Group on Sustainable Development Goals agreed in Rio, and the full membership of the United Nations. These consultations represent an important opportunity to listen to the voices of people and reflect them in the new development agenda.

2 The consultation process

The national consultations were facilitated by the GWP. They were carried out during the period February to May 2013 in a sample of 22 selected countries (Table 1) that was representative of the regions (Annex 1). The consultation built on country surveys carried out in 2011 as part of the preparation of the UN-Water Status Report on progress with integrated approaches to water resources management presented to the Rio+20 meeting[1]. Some consultations linked in to broader national processes (e.g. South Africa, Liberia and Peru) and included participation by senior political figures.

Table 1. Country consultations

Antigua and Barbuda	Ghana	Mozambique	Tanzania
Bangladesh	Guatemala	Nicaragua	Thailand
Benin	Indonesia	Peru	Uganda
Brazil	Jordan	South Africa	Uzbekistan
China	Kenya	Switzerland	
Georgia	Liberia	Tajikistan	

The consultations were carried out by local GWP partners in collaboration with government and generally consisted of a one day session chaired by a senior government official. Participation varied from country to country, involving about 1,000 participants overall from different social groups at different levels. Getting a broad stakeholder representation was of critical importance in the consultations. As time and funds only permitted a limited number of participants, each country invited a balance of stakeholders covering the three key sectors of society: government (e.g. ministry officials, agencies, regulators, local government and basin managers), the private sector (e.g. consultants and utility companies) and civil society (e.g. NGOs and academics). In a few countries international organisations (e.g. UNDP, Word Bank and UNECE) and donor representatives also attended.

A particular effort was made to include participants from non-water institutions, given their impact on water matters. The GWP experience of engaging with various other sectors, for example in preparing IWRM plans, enabled a good participation. There was considerable variation between countries, but on average the non-water participants constituted about 20% of the attendees. These included mainly government ministry and agency officials from agriculture, environment, energy and health, but also from tourism, mining, trade and forestry depending on local issues. It is clear that after many years of promoting an integrated approach many countries recognise the importance of cross sector coordination.

Actual wording from the consultation reports has been used extensively throughout this summary report and the full country consultation reports are available at www.gwp.org.

[1] UNEP 2012. The UN-Water Status Report on the Application of Integrated Approaches to Water Resources Management.

3 Importance of water in national development

"Water is central to human needs, equitable growth and development. It is one of the key drivers of sustainable economic growth through contribution to activities such as agriculture, manufacturing, mines, energy and transport. It contributes to social activities such as productive use of water within households (poverty alleviation), water for drinking, sanitation and health, etc. It should therefore be managed in a manner that is sensitive to and supportive of the many competing demands that is placed on it. Further, the management activities should not compromise the requirements of the future generations as well as ecological requirements. Based on these elements, water should be central to the integrated planning and development processes of a country." (South Africa)

Countries are strongly aware of the importance of water in national development as evidenced by their willingness to participate in this consultation, their statements on the importance of water, and the enormous effort countries have made in the last 20 years to reform the way water is being managed.

The reasons why water is important to national development differ from country to country, but the constant feature is that it is always a crucial factor. Most countries identify food production, energy production, livelihoods, health and tourism as key elements of national development that are impacted by their water resource conditions. However water is not only important for its positive contributions to development, but also for its negative impact under adverse circumstances. It is particularly important to note the extent to which countries are raising concerns about the impacts of floods, droughts, storms and other water related phenomena. Water stress can result in competition for water between countries or communities with negative economic consequences and conflicts and this does not only occur in arid countries, but is a concern raised in several of the country consultations (see Box 1). Many countries raised the issue of 'water security' which embraces the many different facets of water management and development.

Box 1: Water is unevenly distributed

- Jawa island has 57.5 % of the population, but holds only 4.2 % of national potential water. (Indonesia).
- 42% of the water offer is in the Gulf of Mexico basin, the least populated and developed zone, while the Pacific Basin has a water offer of 23.7 %, but contains 45% of the population (Guatemala).
- The coast, which comprises only 11% of the country, accounts for more than half (52.8%) of the population and only has 2% of the total available water in the country (Peru).

Water provides food and jobs

Tanzania's Water Sector Development Strategy is seen as a tool to address poverty. Investing in improving the infrastructure and water management for irrigation of 2.3 million ha is intended to ensure increased production and incomes for farmers.

Water resources development has helped Bangladesh to almost achieve food sufficiency, but pressures remain on agriculture to intensify production because of the increasing population. Agricultural water infrastructure in China is not yet advanced enough to ensure national food security and in Uganda agriculture is primarily rain-fed and the country continues to battle with food security. In Uganda, as in many developing countries, the majority of the population rely on agriculture for livelihoods and in Benin, where less than 3% of the renewable water resources are being used, agriculture is almost exclusively rain-fed subsistence farming.

Agriculturally-based activity (agriculture, forestry and livestock) is the largest water user in Mozambique, accounting for approximately 72% and constituting 20% of the national gross domestic product (GDP). However, 45% of the country is classified as appropriate for irrigation, and only 4% is currently cultivated. Management of water in agriculture needs significant attention and investment to increase water use efficiency, maximise productivity and address increasing food problems (Tajikistan, see Box 2).

Box 2: Tajikistan, Water use efficiency in agriculture
The efficiency of irrigation systems is 55.2%, mainly from a huge loss of water in the fields and low efficiency and reliability of the regional water meters. An indicator of water use efficiency in irrigated agriculture is the income received from 1 m^3 of water diverted for irrigation of crops or the amount of water consumed to produce 1 tonne of crops. The productivity of abstracted water is very low at USD0.2/m^3. This reduction in water productivity is associated with a reduction in crop yields, which are the consequence of reducing the amount of fertilizer applied and the depreciation of agricultural machinery stock amongst others.

Hydropower drives the economy

In Brazil hydropower is of national importance accounting for 70% of the total electrical power produced and is under continued development.

At the present, in Guatemala, 50% of energy production is hydropower, but only 17% of the hydroelectric potential of 5,000 MW has been developed. If all the hydroelectric potential would be developed, the country could not only be energy independent, but also an energy exporter. A similar situation exists in Georgia and in Tajikistan, where only 3.2% of the hydropower potential is currently generated, yet every year from October to April Tajikistan is forced to impose restrictions on the consumption of electricity. Because of the shortage of electricity and other reasons, water is supplied to the population according to a schedule, mostly in the evenings and in the mornings.

Tanzania demonstrates that a sector approach may give rise to unforeseen problems (see Box 3). Conflicting demands for water resources were reported by several countries as being on the rise, often with serious consequences for development.

Box 3: Tanzania, competition at a cost
In Great Ruaha Catchment, the second largest national park in Africa and the largest water reservoir for electric power production are downstream from the irrigators. The lower stretch of the river dries up during the dry season because of upstream uses. The resulting threat to biodiversity in the area is a threat to tourism, which contributes to the economic development of the country. The importance of the water and energy linkage may be explained by the indication that the installed hydropower system (amounting to 561 MW) was producing 73% of the total power generated in the country by 2010. A report stated that power rationing in Tanzania was “causing huge losses” in a number of sectors, costing the economy USD1.7 million per day. This provides an indication on how important water is in the electric power sector.

Water is essential for human well-being

Drinking water, sanitation and good hygiene practices are considered vital for human development. So much so that in 2010 the UN General Assembly adopted a resolution recognising safe drinking water and sanitation as a human right. In the same year Kenya enacted a new constitution recognising water and sanitation as a human right. Access to a water supply and sanitation services impacts on the well-being of the population, is closely associated with poverty alleviation and affects national development through health service costs, productivity and educational achievement. All country consultations referred to progress and problems with access to water

and sanitation services and especially to the lack of progress with sanitation, with the consequent negative impacts on the environment and water quality.

Population growth and urbanisation are factors that low and middle income countries will see affecting service delivery for the coming decades. Rapid development in China is accompanied by rapid urbanisation and by 2030 70% of its population will be living in urban areas compared to the current figure of 51%. At this rate, the urban population will grow by more than 300 million and the total urban population in China will be over 1 billion.

Bangladesh plans to provide all people with a safe and reliable supply of potable water and sanitation services on an equitable basis to safeguard public health and protect the environment. However arsenic contamination of ground water and population growth are slowing progress. The population of Bangladesh is expected to rise to 181 million by 2025 and to 224 million by 2050. Rapid urbanisation is expected with 40% of people living in the towns and major cities by 2025, and 60% by 2050.

In Brazil around 80% of residential units have access to public networks for water supply and 46% to wastewater collection. This means that urban water supply coverage is quite high, whereas sanitation is still lagging behind. At present, government initiatives and investments are giving high priority to both fields, but a big effort is still needed to reduce the organic loads in water bodies.

In Guatemala more than 86% of the urban population have water and sanitation services, the rural area, 65%, but the continuity and quality of the services are reportedly faulty. According to records, in 2005 the health system attended to more than half a million cases of children with illnesses related to water.

In Peru it is estimated that only 30% of localities are supplied with drinking water services under appropriate conditions in quantity, quality and continuity. About 40% of localities have management problems with their services and the infrastructure is in a poor condition. The remaining 30% have their services in poor condition or not working. Despite significant investment in the sector, it is still insufficient.

It is estimated that, during 2009, the sewage systems managed by sanitation companies in Peru collected approximately 786.4 million m^3 of wastewater from household connections. However, because of the lack of adequate infrastructure at the national level, only 35% of this volume receives some treatment before being discharged into a receiving body. Similarly it was reported from Bangladesh that wastewater management is inadequate, aquatic resources and the natural environment are under severe threat from an alarming rise in pollution resulting mainly from industrial growth and poor sanitation.

Extreme events are common

There are many reports showing how development, particularly in Africa, is exposed to a wide range of adverse natural events. Hydro-meteorological hazards (principally droughts and floods) have the largest impact on GDP. Even the impact of just rainfall variation can be high. Country consultations demonstrated the reality of these facts on the ground in all regions of the world with on-going concerns about risks, adaptation and coping.

In recent years, Peru has experienced an increase in the frequency of extreme weather and events related to water, such as droughts and floods. These are attributed to climate change and exacerbated by bad practices in the management of natural resources (see Box 4).

Box 4: Extreme water events in Peru
Extreme water events have caused major disasters nationwide and substantial human and economic losses, as stated in a report by the Andean Community of Nations in 2009. Between 1970 and 2007, Peru experienced 19,928 natural disasters, which resulted in more than 82,000 deaths, more than 4 million victims, a further 3.5 million persons affected, 192,000 homes destroyed and 313,000 homes affected. According to this report, prepared for the four Andean countries, in the past 37 years, hydro-meteorological phenomena influenced by global climate change constituted 71% of local disaster records, highlighting the high vulnerability of the sub-region to threats associated with climate, particularly events such as floods and landslides.

Mozambique ranks third amongst African countries for exposure to risks from multiple weather-related hazards. Recent floods, cyclones and droughts have severely affected the country's economy.

China reports that global climate change intensifies extreme weather events, including heavy rainfall and extraordinary typhoons, heat waves and severe droughts in some regions. The countermeasures for water disasters are more complex and arduous because of the higher frequency. In some regions of Brazil, flooding and water related disasters are becoming increasingly serious. While in Bangladesh the sea level is rising, inundating coastal lands and erratic rainfall and extreme events are being witnessed increasingly. Half of the population (49.60%), who survive on less than USD1.25 per head per day, is extremely vulnerable to the effects of climate change. In the south-west region of Bangladesh climatic migration is already evident.

In summary

- water is recognised as a pivotal ingredient for national development, in many cases providing food, energy and jobs and with the potential for making an even greater contribution to national development in the future
- safe drinking water is also the basis for the well-being of people and as such has recently been recognised by the UN General Assembly as a human right; a right which is already being enshrined in some national laws
- the environment and water quality are being negatively affected in many countries by extensive pollution, primarily from untreated wastewater
- however, water is also a medium for destruction (through floods and storms), and social upheaval (through displacement, food deficits and disease). Effects occur across social, economic and environmental dimensions, are complex to manage and have consequences for GDP.

4 Key national priorities for the sustainable development of water

This consultation on the post-2015 development agenda follows closely on the global survey of the progress with integrated approaches to water resources management that was undertaken by the UN in 2011. A total of 134 countries responded to that survey and the results were reported both globally[2] and in a separate report for Africa[3]. It was clear that countries have committed to implementing the messages of the Rio de Janeiro Earth Summit and the Johannesburg Programme of Implementation on water as they reported progress with many components making up an integrated approach to water resources management. The experiences that countries have gained in the 20 years since the Earth Summit and in the process of addressing the Millennium Development Goals (MDGs) shows in the results of this consultation:

- many countries have up to date plans, strategies and legal instruments that have served to inform the consultation
- Stakeholders are better informed of the challenges of water resources management
- countries are experienced in using international goals to mobilise action and are clear where their priorities lie.

African leaders, civil society and development partners meeting in Monrovia[4], Liberia, made a clear statement on the value of the MDGs as a framework for planning and mobilising action on water with a clear priority for maintaining action on water after 2015 (see Box 5).

The following sections follow the structure of the consultations and address:

- water resources management
- water sanitation and hygiene (WASH);
- wastewater treatment
- water quality management.

Box 5: Liberia, key messages

1. The post-2015 development agenda for Africa as it relates to water management should be premised on the Africa Water Vision 2025.
2. Water is essential in the future development framework in order to attain vital economic, health, educational, agriculture/food and energy benefits.
3. Water is also a pre-requisite for maintaining ecosystem services and supporting resilience to climate change.
4. Universal access to sustainable safe drinking water, sanitation and hygiene in our time is a crucial requirement.
5. Making fundamental changes in African water resource management is the basis of water security and sustainable development.
6. Wastewater is not wasted water – it is a resource in environmental and economic terms
7. We can and we must prevent the polluting impact of wastewater, ensuring its re-use at an appropriate quality, and reaping the financial, health and environmental benefits.

The country consultations were very rich and there were some common themes arising that have been highlighted, including risk management, coordination and transboundary waters.

[2] UNEP 2012. The UN-Water Status Report on the Application of Integrated Approaches to Water Resources Management.
[3] African Ministers' Council on Water (AMCOW), 2012. Status Report on the Application of Integrated Approaches to Water Resources Management in Africa.
[4] Monrovia Water Sector Declaration to UN High-Level Panel on the Post-2015 Development Agenda (HLP), January 2013.

4.1 Water resources management

All countries recognise that their future water resources management should follow an integrated approach and this is an overarching goal.

Switzerland said that, "Much remains to be done in terms of designing, financing and implementing an integrated approach to water resources management as outlined in the 2002 Johannesburg Plan of Implementation. It was agreed that all countries should develop integrated water resources management (IWRM) plans and define water rights, legal systems and allocation mechanisms, establish water institutions, put in place participatory processes and adopt integrated water basin approaches."

Box 6: Brazil, first steps on a journey
Outstanding steps were taken in the implementation of the Water Resources Policy, such as the creation of the National Water Agency in the year 2000, and the elaboration of the National Water Resources Plan, with considerable social participation. The Plan was issued in 2006 for the first time in the country's history. In parallel, many States have also issued or are preparing their State Water Resources Plans, which, altogether, are seen as necessary instruments to orient sustainable development and institutional action to improve IWRM, although their implementation at the sub-national level is still very slow.

4.1.1 Reforms to water resources management

Brazil (see Box 6) probably typifies the situation for many countries where significant steps have been taken to respond to the need for better water resources management but this was never going to be a 'quick fix' and these fundamental changes take time. The kinds of problems that Kenya has prioritised (see Box 7) are common to many countries and have far reaching political, social and financial implications. The establishment of an effective water resources management system is one fundamental part of the long term solution.

Box 7: Kenya, key water resources priorities
To ensure sustainable development and management of water resources, there is a need to understand the potential and limitations of water resources and, ensure their integrity and sustainability – halt and reverse degradation in water catchments, develop and harness additional water resources, adapt to and mitigate climate change and reduce the effects of water-based emergencies in line with the National Climate Change Response Strategy and integrated transboundary water resource management.

The adoption of integrated approaches to water resources management is work in progress for all of the countries participating in the consultation. Benin and Georgia are only at the first stages of their water sector reform process. The first priority for Benin is the implementation of the national action plan for IWRM adopted by the government in 2012.

The specific priorities countries have identified to progress with water resources management are summarised below. South Africa provided the useful observation that all elements of IWRM are a priority and it comes as a complete package (see Box 8). However, the evidence shows the reality that progress is uneven depending on the confluence of political will, technical competence and social pressure.

Box 8: South Africa, IWRM, a complete package
The stakeholders agreed that all the elements of the IWRM cycle are a priority. Therefore, efforts should be made to implement them simultaneously. The elements include water resource classification, water conservation and water demand management, water resource planning and reconciliation, etc. The IWRM approach will ensure that impacts, such as acid mine drainage, climate change; sewage spillage, eutrophication, etc. are sustainably managed.

Consultations show that there is much work to be done by countries to achieve their goals of the sustainable and equitable use of water resources for growth and development while safeguarding the environment.

A great number of priority actions were raised, representing the full range of water resources management just some of which are identified below according to the three key elements of the integrated approach:

Establishing an enabling environment for change:

- harmonised legal framework and policies (Kenya, Nicaragua, Guatemala, Antigua and Barbuda and Georgia) applied to water resources at the national level with particular attention to regulation/enforcement/compliance (Nicaragua, Jordan, Guatemala, Indonesia and South Africa)
- prioritising actions that produce results in the short term (Brazil) establishing allocation systems (Indonesia and South Africa).

Strengthening institutional systems:

- institutional arrangements with appropriate technical and financial capacity (Ghana, Guatemala, Uzbekistan, Tanzania, Tajikistan and Antigua and Barbuda), especially at the sub-national level (Brazil and South Africa)
- strengthening community organisational structures and participation (Nicaragua, Jordan, Kenya, China, Indonesia, Mozambique, Uzbekistan, Uganda and Thailand) and taking gender into account (Mozambique)
- improving private sector roles in planning, implementation and supervision of water resources management (Indonesia, Mozambique [see Box 9] and Jordan).

Box 9: Mozambique and the private sector
Vision 2025 stresses the need for Mozambique to start deriving greater benefits from creating a stronger national private sector, based in agriculture, including agro-industry, water, tourism, mining and energy sectors.

Applying management instruments:

- establishment of a water resources management fee (Indonesia) and dealing with unaccounted for water (Jordan)
- strengthening knowledge management at different levels (Nicaragua, Ghana, Uzbekistan and Peru) and improving information availability to the public (Jordan and China)

- supply augmentation, e.g. traditional water harvesting methods, and diversification of sources, e.g. brackish water for irrigation, (Indonesia and South Africa)
- integrated watershed and coastal zone management (Bangladesh)
- protect land and water resources (groundwater and water use efficiency) for improved water conservation and ecosystem health (Ghana, Nicaragua, Indonesia, Tanzania and Antigua and Barbuda)
- water efficient irrigation technology will be extended into large areas of China and is also a priority for other countries to increase agricultural production (Uzbekistan, Tajikistan, Indonesia and Bangladesh).

In summary

Each country identified a selection of priority actions to be applied to advance sustainable development and management of their water resources as a means to harvest their potential social and economic benefits and to reduce the adverse environmental effects of the present means of exploitation.

A significant observation from the list of priorities arising from the consultations is that achieving improved management of global water resources is of extremely high importance across disciplines and segments of society and needs long term support.

4.1.2 Coordination

In its call for an integrated approach Agenda 21 states "Such integration must cover all types of interrelated freshwater bodies, including both surface water and groundwater, and duly consider water quantity and quality aspects. The multi-sectoral nature of water resources development in the context of socio-economic development must be recognized, as well as the multi-interest utilization of water resources for water supply and sanitation, agriculture, industry, urban development, hydropower generation, inland fisheries, transportation, recreation, low and flat lands management and other activities."

Most consultations brought up the issue of coordination as a priority for action.

Box 10: Guatemala, a typical situation?
The problems, detected to achieve an integrated management of water resources, start with the unsatisfied (water) demand that continues to increase as the population grows. The problems continue with the sector vision of the institutions, the unsustainable extraction levels especially in the dry season, and the inadequate quality and quantity of water available for human consumption and irrigation, affecting health and food security. There is a lack of integrated planning at the basin level, a problem that continues without being understood by the political sector and the decision-makers.

According to Tanzania, the coordination, integration and communication on the water, food and energy nexus is necessary to ensure food security, energy security and environmental protection. The need for cross–sector engagement is also evident from the inadequate variety and number of relevant sectors engaged in the basin IWRM plans in Tanzania.

Guatemala reports that although the Combined Program of Water explains the sector and inter-institutional coordination, the public perception is that the projects continue being sector based and that the coordination is not evident (see Box 10).

Stakeholders as well as government agencies may be plagued by "Unclear institutional roles and coordination and reporting mechanisms: How to draw the dividing line (if any) on who does what, when and who is accountable to whom? Complementing roles or conflicting interests?" (Mozambique). This has led Mozambique to identify a priority action to strengthen water resources management institutions. Kenya proposes adopting a sector wide approach to planning, especially involving agriculture and energy and Jordan had similar views.

South Africa identifies the steps to cooperative governance as follows:

- identify areas of interface between role players
- develop mechanisms for cooperation, e.g. effective structures and systems, joint strategy development, etc.
- institutionalise and fund cooperative governance.

Box 11: China, integrated approach
The IWRM system, combining river basin and regional administration management, will be accomplished by unified planning, distribution and regulation of water resources in river basins after the establishment of participatory, democratic consultation and joint decision-making mechanisms. Further improvements also involve the integration of urban and rural water supplies by strengthening the integrated management of administrative regions, combining the assessment, planning, distribution, regulation, conservation and protection of urban and rural water resources, coordinating the construction of water source areas, flood control, drainage, supply and demand, conservation, discharge and sewage treatment and reuse.

Indonesia provides a specific set of tasks to improve coordination and IWRM through:

- re-arranging the tasks and functions of institutions related to water resources management to improve coordination and integration of the cross-sector programme
- completing preparation of Strategic Plans for River Basin water resources management for all 131 river basins of Indonesia by 2015
- improving coordination on water resources management at the national, provincial and river basin levels by the establishment and functioning of water resources management councils.

China is also very specific on what needs to be done (see Box 11). And Peru has prepared a draft cross-sector agreement, to be signed by various ministries related to water resources and the head of the water agency, which reflects the high priority given to water by the government and the need to manage it in an integrated way.

Stakeholders also identified inter-sector coordination as an issue with regard to effective action for climate change adaptation (Peru), for WASH (Uganda and Tanzania) and for food security (Uzbekistan, see Box 12).

Uganda prioritised better linkages between WASH and water resources management to ensure the sustainability of services, improve conservation techniques, like rain water harvesting, and to promote water demand management practices. Other cross sector

Box 12: Uzbekistan, achieving food security
Achieving food security is a priority issue for Uzbekistan, given its landlocked location; low incomes in rural areas and transition from planned to market economy. The target is to increase water productivity by 50% and land productivity by 20% by 2025 by adopting water saving technologies and improving interactions between different organisations in the water and agricultural sectors.

linkages would help to strengthen multiple water use investments.

Tanzania brought up the importance of clear reporting and communication arrangements for better coordination and integration. It was felt that more WASH opportunities could be created by better linkages with other sectors and their initiatives – for example public-private partnerships on solid waste management, green economic development, etc.

In summary

Coordination between different institutions is a pre-requisite for effective water management and development but is difficult to achieve. It is becoming of increasing interest to water users, water managers and politicians alike as water stress increases.

It is not only in the management of water resources, but also in the delivery of water supply and sanitation services, food security and managing water risks, that demands for a more coordinated approach are increasing.

The strong concerns across countries and stakeholders about the effectiveness of coordination, with its inherent difficulties, but enormous potential benefits, suggest that it is an important issue for the coming decades.

4.1.3 Transboundary waters

Several countries in the consultation are in a downstream situation where most, or an important part, of their surface water resources are dependent upon flows from other countries. (Bangladesh, Mozambique and Uzbekistan). Poor management upstream can have catastrophic impacts downstream and, not surprisingly, such countries are concerned about risk assessment (see earlier section), development of and compliance with transboundary agreements, and accurate data from forecasting and monitoring.

Tajikistan reportedly has 4% of the world’s hydropower resources and the consultation identified that cooperation on hydropower development could have a regional impact of billions of dollars each year and reduce greenhouse gas emissions. On average, Tajikistan's rivers account for about 55% of the average annual flow of rivers in the basin of the Aral Sea and the consultation identified a priority to jointly develop a regional water, energy, food and environmental policy, taking into account the need for the sustainable use and protection of resources.

Priorities include:

- develop transboundary agreements on the sustainable use and equitable share of transboundary watercourses. These may include forecasts of the future water situation for an agreed time scale and consider water allocations, environment, water quality, water security and management guidelines taking into account the interests of all users and based on good practices at national and international levels (Mozambique, Uzbekistan, Tajikistan, Jordan, Tanzania and Georgia)
- strengthen national and basin capacity to ensure the enforcement and compliance with agreements on transboundary rivers, including monitoring and more binding mechanisms for dispute settlement (Mozambique and Georgia)
- strengthen transboundary water management systems through bi/trilateral commissions and river basin organisations. This should further lead to technical expertise and information exchanges between the countries involved. (South Africa).

In summary

Many countries share basins and aquifers and are concerned about the establishment of and compliance with agreements, the scope of the agreements in the context of effective water resources management and information exchange.

The management of transboundary water systems requires cross border cooperation in all aspects of water resources management, but is mainly prioritised by downstream countries.

4.1.4 Infrastructure

Infrastructure development was not explicit in the consultations, but was there by implication. Hydropower generation (Uganda, Guatemala and Benin), irrigation (China, Bangladesh, Benin and Uganda), WASH (see section 4.2), rainwater harvesting (Uganda), wastewater management (see section 4.3) and water resources management (see section 4.1) all require investment for service delivery, economic development, climate risk management and ecosystem health. Benin reports little development of its water resources and identified the need for investment. All stakeholders now seem to agree on the crucial role to be played by water in the socio-economic development of the country, and the priority development activities in the coming years involve significant infrastructure development (see Box 13).

Box 13: Benin, development priorities
Water for the agricultural sector comes second to that for drinking water. The challenge in this area is to increase the land under irrigation by approximately 60,000 ha between 2015 and 2030.
Water for the energy sector is third in order of priority. The construction of several hydroelectric dams is proposed to improve the energy independence of the country and produce annually between 1,300 and 1,500 GWh of power.

Tajikistan identified a range of infrastructure development priorities to address inefficiency and productivity problems in agriculture, the need for a big expansion in hydropower and associated water storage, and for the continued development of water and sanitation infrastructure. Water infrastructure was described as worn out and, in some cases, technically obsolete.

South Africa identified the need for greater attention to standards and the sustainability of infrastructure in both water resources and water services. This should include use of international full cycle asset management methods. Increased funding is needed for infrastructure development and maintenance.

China gives priority to the rehabilitation and improvement of irrigation systems to increase agricultural productivity. The task of transforming all the large- and medium-sized irrigation systems for water-saving will be completed by 2020 and some new irrigation systems will also be built in regions where conditions are feasible. Mozambique identifies an urgent need for strategic infrastructure to mitigate flood effects.

In summary

Countries have many plans for infrastructure development to harness the economic and social potential of their water resources, to mitigate risk from climate variation and to reduce water pollution from untreated wastewater.

4.1.5 Monitoring and reporting

The UN has recognised the need for the establishment of a monitoring and reporting system for water resources management to complement that already established for water supply and sanitation. The country consultations included a discussion on the constraints and possible solutions for monitoring, reporting and evaluation of how water resources management progresses in the country.

Few countries have a reporting system that can be said to monitor how water resources management is progressing in the country, although monitoring of available water resources is commonly found.

Routine monitoring of water bodies is lacking (Antigua and Barbuda) or inefficient (Nicaragua), and Guatemala discussed how a monitoring system could be constructed when the country lacks an existing governing entity for the water sector.

Uzbekistan has had a hydrological monitoring system in place for 100 years and Peru has a national information system of water resources that collects data on water quantity and quality. But participants in Georgia agreed that a monitoring and reporting programme should be developed for the National IWRM Plan implementation to keep it on track, to ensure budget allocations are progressing and for other aspects, with reports available to the public.

Box 14: Tanzanian participants said

Water resource management involves regulatory functions including: water resources allocation (surface and groundwater); pollution monitoring and control; stakeholder participation; monitoring of the resources; information management; economic and financial considerations; integrated basin planning for the water sector and disaster management.

In order to measure the status of the resource and the impacts of water related initiatives, which in most cases fall under different institutions in the water sector, a system of monitoring and reporting needs to be established; a system that is uniform and consistent that can be used by different stakeholders.

Setting and establishing indicators and the reporting is difficult (Jordan) although there are established monitoring systems for water resources management that can be learned from (Bangladesh, Brazil, Kenya, South Africa and Tanzania [see Box 14]). In Brazil, besides government reports, there are also reports published by NGOs dealing with water related issues and the performance of water resources management agents. Other examples of reporting strategies include the 'Blue Drop' and 'Green Drop' certification programmes for drinking water and wastewater in South Africa. Kenya has put several monitoring and reporting mechanisms in place since 2002, as has Tanzania. The Tanzanian participants took the opportunity to compare their reporting system to the indicators used by UN-Water for the 2012 survey on progress with integrated approaches to water resources management. Discussion centred on whether they are being monitored, is data available or what is missing and they found that the list was very relevant to their situation.

In summary

Although monitoring systems are weak or lacking in some countries, there are many examples of partial monitoring and reporting systems for water resources management that can be further improved and used as a basis for assessing progress.

4.2 Water supply, sanitation and hygiene

Switzerland summarised the key challenge related to WASH as, "More than 780 million people still lack access to safe drinking water and 2.5 billion lack improved sanitation – more than 1 billion of them practicing open defecation. From a human rights point of view, it is particularly important to address in the future especially also the issue of equity and non-discrimination. The question is not if the world can fulfil universal access to Water, Sanitation and Hygiene, but rather how to do so."

Water, sanitation and hygiene is a subject almost as complex as water resources, and the country consultations came up with a similarly large number of priority actions, according to their own perceived needs. The most common of these are summarised below and cover many of the main action areas for WASH.

Wastewater is treated in a separate section (4.3), but is a component of sanitation solutions and should be seen as an integral element in any WASH discussion.

It is worth noting that all countries expressed the need for continued action on WASH and several specifically stated that their priority in the coming years was the transition to universal access to safe drinking water and sanitation (Peru, Tanzania, Brazil, Bangladesh and Ghana [see Box 15]).

In Benin drinking water is, by law, the first priority of the country and they report it is the only sector in which the MDGs are likely to be achieved by 2015. At the present rate of progress, close to 100% coverage is expected by 2025 (rural and urban). Sanitation, however, remains neglected and is described as the weakest link in WASH with between 67 and 87% of Benin being without access to hygiene and basic sanitation. (see Box 16). The lack of priority ascribed to sanitation can be seen by the absence of any discussion on sanitation in the Thailand consultation. The general Law on National Water for Nicaragua recognises that clean drinking water and sanitation are essential to the realisation of all human rights.

Regulations and standards

For Indonesia the priority includes development of standards and criteria for WASH at all levels, including provision of regulations, norms, standard and guidelines. Whereas for Guatemala the priority is in effective application of the regulatory scheme, which needs a route map and a properly budgeted/financed action plan.

Box 15: China, 90% of rural people with water

In the next years until 2030, taking the people-oriented principle, the focus will be on comprehensive solutions to the security of drinking water for rural people. The centralised water supply in rural areas will benefit up to about 90% of the rural population. The actions will greatly improve the water supply rate, raise the level of water supply security, increase the rate of

Box 16: Benin, sanitation targets

The most important challenge for the central government and its agencies after 2015 is to bridge the gap between the coverage of drinking water needs and the needs for infrastructure, and hygiene and basic sanitation. This is the only condition for the population to effectively and fully enjoy the effects of the beneficial impacts expected from efforts made to provide drinking water.

It is proposed that the country retains the target to cover 80%, on average, of the country's infrastructure needs, sanitation facilities and basic sanitation by 2030, including covering 100% of needs in urban areas.

Jordan suggests more research is needed to recalculate and redefine minimum daily per capita water requirements. The drinking water standards of bottled water need to be addressed as 40% of people use bottled water.

Financing

Countries are concerned about the revenue raised from water, as artificially low tariffs continue to affect the water infrastructure, with low wages for employees in the water sector and a drain of highly skilled professionals from the industry (Tajikistan). Tanzania finds that opportunities for financing WASH are limited and Uganda suggests refocusing the financing approach to move away from donor dependency e.g. promote micro-credit.

South Africa suggests there should be a drive towards revenue enhancement and management through billing and collection within municipalities, as not all households are indigent. Those who can pay, must pay to support operation and maintenance activities. Brazil is also examining implementing financing systems in low-income areas in order to achieve acceptable services and results.

Technologies

African countries (Kenya, Uganda and Tanzania) emphasise the importance of appropriate technologies that are affordable, culturally acceptable, easy to operate and maintain, and use locally available materials and knowledge systems. They should be suitable for unplanned and informal settlements, but technology options should also consider the increasing need for sewerage networks (Kenya). Affected as it is by arsenic contaminated groundwater, Bangladesh has a priority to develop dependable water supply systems using surface water.

Institutional strengthening

From Africa to Latin America the strengthening of community organisational structures to participate effectively in water and sanitation services is proposed. Uganda would like to see multi-stakeholder participation in planning, implementing, monitoring and evaluation of WASH projects, while Guatemala would like to see monitoring systems built from the local to national levels. Nicaragua will promote and strengthen drinking water and sanitation committees and their national, departmental and municipal networks.

Knowledge management and awareness

Coordination, a subject addressed earlier, and synergy will be assisted in Mozambique by development of a water, sanitation and hygiene database, which would include a list of WASH actors, what they are doing and where they act/work.

Education and awareness creation at all levels by all stakeholders is very important for success in accessing safe water, sanitation and hygiene (Tanzania, Ghana, Nicaragua and Indonesia).

Skills development

South Africa proposes continuous capacity and skills development support on WASH focused at the household level, where it is also linked to adult basic education and training. Guatemala is looking at more formal education at all levels for training and technical support in all water and sanitation projects.

Private sector

There is interest in more private sector participation in WASH to assist with the operation and maintenance of water supplies (Indonesia and Tanzania) and the development of sanitation systems (Mozambique). Mozambique and Ghana are particularly keen to increase the opportunities for small national businesses or entrepreneurs.

In summary

Water supply and sanitation are presented as on-going programmes and with positive results for most countries. There are country specific issues identified for attention. Countries clearly identify the priority to continue to address access to basic services and expressly state, in some cases, the objective of full coverage in the coming 20 years.

Most country consultations identify slow progress with sanitation, especially in rural communities. Water supply, sanitation and hygiene should not be discussed without reference to the wastewater issue presented below and the related impacts on the environment, health and water quality.

4.3 Wastewater treatment systems

Untreated wastewater is one of the most important contributors to pollution around the world and can cause significant economic and environmental damage (see Box 17). Countries expressed concerns about several aspects of wastewater management which led to the identification of priority actions to:

- address legal and compliance issues
- address discharge of untreated wastewater
- increase wastewater treatment systems and provide incentives for connections.

Box 17: Thailand, pollution is expensive
In Maeklong, this year, polluted water has destroyed the sea shell plantations at a cost of more than THB10,000 million (USD330 million). Small- and medium- fisheries are now suffering from the loss and are in the process of negotiating for compensation.

Tanzania already has legislation (the Water Resources Management Act, the Water Supply and Sanitation Act and the Environmental Management Act) that addresses adequately issues of wastewater management and water quality, but priority should be given to the harmonisation and coordination mechanisms to implement and monitor between the three acts.

There is a need to focus on targeted, efficient and effective regulation in South Africa with a focus on technical and economic aspects. In Guatemala, 85% of wastewater discharges are without any treatment. Legislation and regulations exist, but their application is very weak and the sanctions are not sufficiently strict to force compliance. Priority is, therefore, given to institutional strengthening and

Box 18: Peru, 100% wastewater target
Strengthen mechanisms to encourage optimization of the use and reuse of water for water safety. All sectors must contribute to ensure that wastewater is not discharged into natural sources without prior treatment. Although highly ambitious, according to the National Plan for Environmental Action 2011-2021, by 2021, 100% of urban domestic wastewater shall be treated and 50% will be reused. Additionally, 30% of the sewage from rural areas shall be treated and reused. This alternative source of water is a valuable resource that could replace the volume of water for first time use in activities that do not require the water to be of drinking quality.

increased sanctions. South Africa also intends to focus on regulation that is incentive and risk-based, supported by compliance and enforcement.

Wastewater management is inadequate in many countries with effects on the natural environment (Bangladesh) or tourism (Antigua and Barbuda) being among the consequences reported. Peru (see Box 18) and China have made specific targets for wastewater treatment, while other countries have less ambitious priorities. By 2030, 160,000 km of new urban sewage pipes will be laid in China and there will be 42 million tonne of new sewage treatment capacity. Therefore, all counties and key towns will have sewage treatment capacity and the rate of urban sewage treatment will be 85%.

To protect the tourism industry Antigua and Barbuda expressed the need to monitor, evaluate and report on the wastewater and storm-water maintenance and operation systems at these tourism plants. It is necessary also to prioritise development of sewerage systems in the city and develop effective legislation to control the disposal of wastewater.

There is an identified need to improve the performance of existing infrastructure (South Africa, Uganda and Georgia), including providing incentives for people to connect to sewer systems (Uganda). Brazil has a 'pollution zero' programme underway that includes increasing wastewater treatment by providing enough treatment plants, not only sewage pipeline networks. Alongside upgrading strategies is the priority for investment in new systems, (Mozambique, Kenya, Thailand and Georgia [see Box 19]) although recognising that this may need action to raise awareness and understanding among key decision-makers of the scale and urgency of the problem of wastewater (Uganda). Planning, developing and operating a comprehensive wastewater management system, including treatment of used water flows to restore its potential as a resource, is a priority for Bangladesh and action on resource recovery and reuse is also a goal for Mozambique, Jordan, Uzbekistan and Ghana.

Box 19: Georgia, wastewater to be treated

Of all the towns and regional centres, only 41 are equipped with sewage systems, while only 30 of them have, or had, a wastewater treatment plant. As such, most water supplies are not linked to sewage collection and treatment facilities. Meanwhile it is estimated that 50% of the sewerage systems in the country are past their service lives and most wastewater is discharged to the rivers untreated.

A significant number of large scale projects to improve the sewerage networks and to install wastewater treatment systems are underway in many towns. However, given the extensive works which must be carried out at the national level and the level of investment required, it will be some time before all sewerage systems will be upgraded to meet the new standards.

In summary

Almost without exception, countries engaged in the consultation identified pollution and wastewater as a priority because of one, or often all, of the following problems. Wastewater is not being collected, not being treated properly, and is polluting freshwater and the environment by being discharged without treatment.

Priority is given to action that improves wastewater treatment, encourages recycling and reduces pollution.

4.4 Water quality management

To quote from one consultation report, "The only certainty in the field of quality of water resources is that the sources of pollution and contamination are growing and the phenomenon is growing alarmingly. Indeed, the population increases, economic activities intensify and industry, though still embryonic, grows slowly but surely. The negative impact on the quality of water resources is growing without any particular action being taken to address the phenomenon to contain it and limit the damage. The threat is real, but for now, it is a major concern in the major urban centers of the country where natural assimilative thresholds are exceeded and wastewater is a serious threat to human health." (Benin)

Water quality management refers to the responsibility of water resources managers to monitor and manage water quality to maintain a healthy environment and ensure water is fit for the purpose to which it is being allocated. The link with pollution control and polluting activities, such as described in the previous section on wastewater treatment systems, is obvious.

Box 20: Antigua and Barbuda, pollution management

The state is in need of a comprehensive Water Pollution Control Act which identifies parameters for water standards, targeting point and non-point sources of pollution.

A funding mechanism is needed to manage non-point pollution programmes that target cropland, construction sites, stream bank erosion, nutrient loads and runoff from roadways and lawns. In this regard, it is determined that priority should be given to generating revenue streams from ecosystem services.

According to the consultation reports, water quality management is one of the least effective components of water resources management and environmental protection programmes. Several countries do not have a water quality control programme at all, or it is in need of review and strengthening. As such, the establishment of effective water quality monitoring and pollution control programmes are a high priority as a means to start tackling the problem (see Box 20).

Water quality is the responsibility of the Pollution Control Department in Thailand which estimates that about one-third of rivers are degraded or polluted. Establishment of a national water quality monitoring programme is a priority (Tanzania, Benin, Ghana, Antigua and Barbuda and Bangladesh) and other countries see the need to improve or extend their existing activities (Jordan). Georgia has adopted revised national chemical, biological and hydro-morphological monitoring programmes for both surface and groundwater and is updating hydro-meteorological data collection systems. Extension of the pollution control programme throughout the country to include heavy metals and hormones (Brazil), regulate agro chemicals (Nicaragua), or discharges (Kenya) and applying controls effectively (Indonesia) are some of the priorities identified.

The availability of properly resourced and staffed analytical laboratories is highlighted as an issue for some countries, resulting in action being prioritised for Mozambique and Jordan.

Antigua and Barbuda identify that water quality is affected by land use and sediments as well as human and industrial waste. They give priority to the establishment of an integrated watershed management strategy. The strategy would emphasise conservation of soil and water as well as water quality from the upper watershed slopes to the coastal wetlands. Adopting a participatory ecosystem-based management (river basin/watershed/aquifer) approach to water resources management provides a framework for addressing environmental needs (Indonesia and Jordan).

Participation is more effective with the availability of reliable information on the state of public health, water and the environment (Brazil).

In summary

Managing water quality is a high priority, but very challenging as it is linked to the existence of an effective pollution control system.

Countries identify a lack of monitoring systems for water quality and environmental impact, coupled with poor enforcement of controls over polluting discharges (mainly wastewater), as making water quality management a high priority issue for the sustainable management of water resources.

4.5 Risk management

The consultations indicate a serious concern about the effect of climate on water availability and on the frequency of extreme weather events. Sensitivity to climate variation is likely to increase as water stress, or competition for water, increases. The context in which countries view these and other threats is in terms of risk management.

Countries already attribute an apparent increase in extreme events to climate change (China, Bangladesh and Uzbekistan, see [Box 21]).

Box 21: Uzbekistan, shrinking glaciers
The impact of climate change is apparent across Central Asia, posing risks to national development in Uzbekistan. It affects water availability and use, agricultural activities and population health, among other things. As result of an average annual temperature rise of about 1°C over the past twenty years, the glaciers of Central Asia have already shrunk by one-third. Glacial retreat causes flood events in the short-term, and declines in long-term water availability, thus intensifying the aridity of the region.

The response by countries has been to:

- prioritise the preparation of National Climate Change Adaptation Plans with an IWRM approach and concern for food security (Nicaragua)
- use adaptive management by improving the flood and drought monitoring, forecasting and early warning systems, improving the management of emergency engineering systems, enhancing emergency management capabilities and improving plans for the extreme events (China, also see Box 22)
- mainstream climate change adaptation and resilience building in all water related initiatives; the effect of climate change and variability is evident in Tanzania. For example, the recent droughts and floods call for development of appropriate adaptation and coping strategies for the future (Tanzania).

Box 22: China, response to climate change
By 2030, with the target of protecting the people's lives and safety, flood and drought control, disaster reduction and a water resources security systems adapted to socio-economic development and future trends will be set up.
Basically, the safeguard systems for flood and drought control and disaster reduction will establish measures for strengthening improvements in flood control in key areas or geologically fragile ones. The measures will safeguard against mountain flash floods and provide protection to some small and medium-sized rivers and small dangerous

Nicaragua is considered to have one of the highest climate risks worldwide. This, coupled with the accelerated process of deforestation in the upper watershed areas and the absence of systems for domestic wastewater treatment, lead to the continuing degradation of physical, chemical and bacteriological conditions of the water sources. Their priority is to implement the National Risk Management Plan.

Forecasting and early warning systems are a priority for Bangladesh, Ghana, Mozambique and China. Mozambique emphasised the need to use local government to ensure that warnings reach affected communities quickly, whereas Jordan expressed the need for studies on impacts of reduced as well as varied precipitation.

New and existing infrastructure should be built to appropriate safety standards to reduce risks from extreme events. Likewise, river flows should be managed by bank stabilisation and dredging to reduce risks from extreme events (Bangladesh, see Box 23). In Brazil a new civil protection and defence policy was approved in 2012 with the objective of improving risk management. River basins are considered as the planning basis for developing civil defence programmes. One priority is to provide technical support and funds to local governments to implement efficient mechanisms for the prevention of water related disasters (risk management at the basin level) and improve warning systems and emergency management.

Box 23: Bangladesh, managing risks

Bangladesh is a disaster prone country. The water related disasters include floods, erosion, cyclonic surges, salinity intrusion, droughts, surface water pollution, arsenic contamination, depletion of ground water and tsunamis. All these disasters are accentuated by climate change.

The water related disaster management challenges, as identified in the National Consultations are:

- preparation of a comprehensive disaster management plan
- resolution of all transboundary water issues
- combating climate change.

The national consultations suggested that for management of water related disasters, both structural and non-structural measures need to be undertaken, both at the national level and the regional level.

One priority issue in Uzbekistan and Tajikistan is transboundary water infrastructure. While bringing multiple benefits in terms of seasonal and long term flow regulation, large dams also present a significant potential threat. In the case of natural events and anthropogenic accidents, disastrous effects may occur across the region.

To solve the problem a national strategy and action plan is needed to build institutional and legal frameworks on the sustainability of large infrastructures beyond national boundaries (at the transboundary scale) to ensure future water security. The plans should:

- monitor and assess the long term safety of hydraulic structures, especially on transboundary watercourses, and create relevant public institutions to fulfil these functions
- build the capacity of national and regional bodies to ensure the safety of hydraulic structures and to control floods, mudslides and other emergencies
- draw up and sign regional (basin) agreements on the safety of large structures (Uzbekistan).

Box 24: Antigua and Barbuda, risk management systems

The priority is to strengthen the risk management system. In 2012, the Government incorporated the National Policy for Disaster Risk Management as a mandatory policy for all entities of national government. From this perspective it is important that all sectors work together and prioritise those public investment projects that are the most efficient. In order to prioritise the joint action of the sectors in assessing the vulnerability of the watersheds to climate change, it will be necessary to harmonise the prioritisation criteria, so that they have combined and complementary efforts.

Antigua and Barbuda needs to develop a pre- and post-disaster management plan for agriculture as it relates to drought, floods, and hurricanes (see Box 24). The plan requires that priority should be given to:

- planning for contingencies in preparation for breakdowns in essential services
- updating hazard maps, vulnerability zones and capacity analysis
- building capacity across agencies at all levels.

In summary

Countries recognise that economic, social and environmental risks from water related events have to be identified and managed as a priority. These may range from the localised effects of natural rainfall variations to extreme climate events and may, at one end of the scale, result in localised, but severe, social disruption or, at the other, greatly impact on economic growth, services and livelihoods.

Managing these risks will increasingly become an important forum for the integrated planning and development of water resources for many countries.

5 Discussions on future sustainable development goals

Most countries engaged in a short discussion of their national goals as they look to the future. Although many countries already have plans and policies which define goals and targets for water they took the opportunity to think again in the context of the evolving situation. The Country Reports presented goals in a variety of ways – structured as targets, actions or objectives – and so the term is used loosely in this section.

Countries have goals specific to their own needs and situation. However, a common thread was about implementing water resources management following an integrated approach and using the river basin as the basis of planning.

To update and implement policy and national water resources plans for basins was a common goal (Bangladesh, Antigua and Barbuda, Tanzania, Guatemala, Nicaragua and Mozambique) with specific mention of establishing inter-institutional coordination mechanisms (Nicaragua, Georgia and Kenya) and addressing water security to secure food, energy and livelihoods (Kenya, Ghana, Brazil, Uganda, Indonesia and Peru).

A better understanding of available water resources and their quality underlies any attempt at water security and improved water resources management. Appropriate monitoring programmes for water resources quantity and quality (Bangladesh, Mozambique and Georgia) were recommended with a goal of assured water quality for all uses by 2030 (Uganda and Guatemala).

Ghana identified a goal of securing water availability for food and energy production through resource conservation and efficiency in water use (reduction in transmission losses) by 2030. Nicaragua, Kenya, Brazil, Uganda, Indonesia and Peru all identified achieving water security as a goal with specific objectives of food, energy, livelihood, water services or environmental security.

Reducing risks from extreme weather events or climate change was a feature of several discussions and the associated goals encompassed planning, reliable prediction, flood forecasting and disaster management (Nicaragua, Bangladesh, Ghana, Uganda and Mozambique).

Safe and reliable drinking water supply and sanitation for people in urban and rural areas is a goal across several countries (Ghana, Bangladesh, Brazil and Uganda) although some consultations only reported on achieving existing short-term targets or continuing existing strategies. The Indonesia consultation identified that, “So far there is no regulation that specifically addresses sanitation issues or a plan to develop government regulation on sanitation.” although drinking water regulations and water resources management regulations do concern sanitation. Several goals were described to address the quality of WASH services and, especially, the need to apply existing regulations. (Georgia, Indonesia, Brazil and Kenya).

Goals were identified for increasing the amount of wastewater being treated (Georgia, Uganda, Antigua and Barbuda and Bangladesh), which requires speeding up the construction of wastewater treatment plants (Indonesia and South Africa). These goals had an aim of achieving treatment of 80% of the wastewater by 2030 (Guatemala).

Other issues attracting attention in specific countries during the discussions on goals were:

- capacity building: sharing experiences, institutional strengthening (Kenya, Peru, Mozambique and Georgia)
- private sector involvement: financing (Kenya), operations, policy and financing of water resources management (Mozambique)
- environment: flows, protection of specific ecosystems (Bangladesh and Mozambique)
- transboundary cooperation: compliance, regional coordination, common standards, early warning systems (Bangladesh, Georgia and Tajikistan).

In summary

The consultations identified key areas that should form potential water goals for the coming years as:

- achieving improved water resources management using an integrated approach, with planning based at the system level (usually the river basin), founded on a good understanding of available water resources and quality, and contributing to water security
- achieving safe and reliable drinking water supplies and sanitation for all people in urban and rural areas, with adequate treatment of wastewater to reduce or prevent pollution
- managing risk with operational plans and actions to mitigate the impacts of extreme events and climate change.

6 Final reflections

In a short time, 22 countries organised consultations bringing together stakeholders with diverse backgrounds and interests. This report gives a synthesis of the outcomes, but does not capture all the rich debate. That is available in the Country Reports, accessible on the GWP website.

The structure for the consultations was, of necessity, limited and as a result there are no doubt issues that may have been neglected or received limited attention. Additional priorities may have been identified if the consultations had addressed a broader agenda. Nevertheless, many stakeholders from a wide range of water interest groups, including from water, food, energy and environmental institutions, have contributed to these consultations thus providing a refreshing insight into national water perspectives.

The consultations have shown clear commonality across regions and development status. The quest for improved, sustainable management of water resources is an on-going process which has a high priority for countries. The UN-Water 2012 report on the status of applying integrated approaches to the management of water resources shows clearly the progress that has been made. Many countries have developed new laws, policies and plans, adopting a systems approach with the river basin as the unit of planning and implementation. However, these reforms are complex and long term and implementation is slow. They involve institutional restructuring and extensive adjustments to policy and management systems. The country consultations identify elements of water resources management that need attention, but many countries are still in an early stage of implementation and may still have major gaps in their operations. Maintaining momentum towards sustainable management and development of water resources is a key challenge for the international community.

The consultations gave voice to a wide concern about the limited progress being made with coordination and highlighting the difficulty of achieving an 'integrated' management approach for water. The need for a more integrated approach to water resources management is evident and deserves greater attention when considering the identified threats to water security from increasing urbanisation, population growth, pollution and a more variable climate, as reported from the consultations. This also included the need for better coordination between water using sectors, including agriculture, energy, industry and others.

Progress has been made over the last 20 years in delivering WASH services, which is a policy priority in all countries. The MDGs have served to focus attention on access to safe water and sanitation, and countries express a priority to take this forward and to achieve coverage that approaches universal access. This may be helped by the recognition that safe drinking water and sanitation is a human right internationally, and increasingly at the national level. The consultations, however, stress that commitment and momentum needs to be maintained if access for all is to be achieved. Moreover, additional emphasis is required for sanitation, which consistently lags behind water services. Stressing the human dimension has, however, largely ignored the negative environmental and health impacts from poorly managed wastewater, leading to growing water quality problems. The consultation showed that this is increasingly important for most countries.

Debate about climate change and mitigation is being made operational at the national level by a focus on risk management. While water is clearly demonstrated to be an important ingredient of national development, it is also a key factor in national disasters with dramatic consequences for society, the environment and the national economy. Countries clearly recognise these risks which will increase as competition for water becomes more intense and as climate variation becomes more extreme. Systems have to be established to manage and ameliorate these risks.

Annex 1. Countries participating in the consultation

Region	Country	HDI[1]	Participants	Level 2[2]	Comments
Africa	Kenya	1	27		
	Uganda	1	27	+	
	South Africa	2	100+		Part of a wider government consultation
	Tanzania	1	30		
	Mozambique	1	33	+	
	Benin	1	28	+	
	Ghana	1	14	+	
	Liberia	1	100+		Part of an Africa-wide consultation
Asia and Pacific	Jordan	2	32	+	
	Bangladesh	1	52	+	
	Indonesia	2	54		
	Thailand	2	50		Also held two meetings at sub-national level
	China	2	23	+	
	Tajikistan	2	30		
	Uzbekistan	2	33	+	
Latin America and Caribbean	Brazil	3	17	+	
	Peru	3	100+		Part of a wider government consultation
	Nicaragua	2	29		
	Guatemala	2	65	+	
	Antigua and Barbuda	3	29	+	
Western Europe	Switzerland	4			
Eastern Europe	Georgia	3	27		

Notes

[1] Human Development Index (HDI)

1 = Low HD; 2 = Medium HD; 3 = High HD; 4 = very high HD

[2] The country also engaged in a detailed consultation for the 2012 Status Report on the Application of Integrated Approaches to Water Resources Management.

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