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**INTERACTIVE DISCUSSION: AGRICULTURE AND RURAL DEVELOPMENT
INTERACTIVE DISCUSSION: LAND MANAGEMENT
INTERACTIVE DISCUSSION: DESERTIFICATION AND DROUGHT**

**AGRICULTURE, RURAL DEVELOPMENT, DROUGHT, DESERTIFICATION, AND
LAND ISSUES AFFECTING SUSTAINABLE DEVELOPMENT IN THE UNECE REGION:
ACHIEVEMENTS, TRENDS AND CHALLENGES***

Note by the secretariat

* This document was submitted on the above date due to ongoing consultations with partner organizations.

Summary

This report aims at monitoring implementation of sustainable development policies in the UNECE region in the field of agriculture, rural development, drought, desertification and land. It is submitted to the Third Regional Implementation Meeting (RIM), being held according to the decision adopted by the Economic Commission for Europe at its sixty-second session (E/ECE/1448, para. 23(b)).

The outcome of this Third RIM will constitute the UNECE regional input to the sixteenth session of the Commission on Sustainable Development (CSD-16). The above policy areas, and in addition Africa, comprise the thematic issues under review during the current two-year cycle (2008–2009) of the CSD multi-year programme of work. The review covering Africa, addressing the donor approaches of UNECE member countries to sustainable agriculture and rural development in Africa, is presented in a separate document (ECE/AC.25/2008/4).

This report was prepared by a consultant in cooperation with the UNECE secretariat, with contributions from the secretariats of the United Nations Convention to Combat Desertification, the World Meteorological Organization and the Food and Agriculture Organization of the United Nations.

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I. SUSTAINABLE AGRICULTURE AND RURAL DEVELOPMENT

A. Progress achieved and existing problems

1. All UNECE member States have taken important steps towards sustainable agriculture and rural development in recent years. In the economic dimension, efforts have been focused on higher profitability and productivity of farms, safer and better living conditions for farmers and their families and the rural population in general, and greater prosperity for the agro-food business, including its up- and downstream linkages to the overall economy. In the environment dimension, efforts have mainly been directed towards the sustainable use, management and protection of natural and genetic resources, including the conservation of biodiversity as well as the maintenance and improvement of soil, air and water quality. In the social dimension, recent activities have focused on improving quality of life in rural areas, diversifying economic and employment opportunities, better training and education, and integrating grass-root contributions to rural development.

2. These common issues and developments aside, there are also considerable differences between the UNECE member States. As the UNECE region is comprised of countries with market economies and transition economies, this chapter will thus make distinctions, as appropriate.

3. ***Production systems.*** In Western Europe and North America, production systems continue to be characterized by high productivity. There has also been continuous progress in meeting the growing demand for higher food quality and safer agricultural production. Consumers not only expect the food they are buying to be safe and not contaminated by harmful substances, they also expect production systems to be environmentally sound and sustainable. This is reflected in their purchasing decisions as well as in the political pressure directed at improved government regulation of food quality. Producers, food retailers and governments have responded to the rapidly growing popular demand for quality. Governments have increasingly set stricter food quality standards and tightened the monitoring and enforcement of these standards. Food retailers have also raised their quality standards and increasingly demand credible information regarding compliance with them along the entire food production chain.

4. One indicator of the increased demand for quality food is the growing production of organic food. While quality food, and especially organic food, is typically more expensive, higher prices play a part in contributing to the intensification of agriculture. To a large extent, the production of higher quality food without increasing environmental and economic risk has been possible thanks to investment in new and improved technologies and the application of scientific-based knowledge and more advanced management practices. This is the case, for example with low tillage and low-input fertilizer application techniques, which are now widely available in European Union (EU) and other industrialized countries.

5. In some transition countries (e.g. Kazakhstan and Ukraine), significant progress has been made as well with respect to agricultural productivity. Nonetheless, some countries in Eastern Europe, Caucasus and Central Asia (EECCA) and South-Eastern Europe (SEE) continue to struggle

with environmental problems. Production systems are still often affected by erosion and land degradation, soil salinization and contamination by harmful emissions, degradation of waterways, improper nutrient management systems, poor storage facilities for manure, a slowly growing nutrient deficiency in many soils, and biodiversity loss. Given improved market access to new technologies and improving overall economic prosperity, some of these countries (e.g. Croatia; Romania and Bulgaria, as new EU countries) are currently making significant progress in reducing these problems.

6. ***Capacity-building, research and development.*** In those countries with a higher GDP per capita, capacity-building and research in sustainable agriculture and rural development continue to be of high quality. Support measures to farmers and other rural entrepreneurs, economists, planners and analysts have improved through training, education and skill enhancement. In addition, the public infrastructure in these countries is such that even farmers in the remote areas typically have access to high-speed Internet connections and the copious information now available.

7. In transition countries, agricultural research, extension¹ and education reflect historical structures designed primarily to support the needs of large-scale technology-intensive collective or commercial farms. Subsequently, only a few institutes and programmes have been focused primarily on a privatized, diversified, semi-subsistence² agricultural sector. Some governments have accepted new models of extension support based on field teams, regional offices and decentralized programmes supported by donor projects. However, most advisory systems are still unsustainable and not adapted to the needs of farmers in a market-led economy. Reduced research and extension financing has led to declines in new investment for and dissemination of technology. In addition, a loss of regional and traditional research contacts has occurred, while at the same time linkages among the agricultural knowledge triangle (research-extension-education) have yet to be established.

8. Although it is generally accepted that the research and education system must continue to develop research programmes and curricula that integrate traditional studies with more market-oriented and applied work, only a few universities and research institutions have made significant efforts to reform their activities.

9. Transition countries will not be able to capitalize on their opportunities in agriculture for sustainable rural development unless they make further progress in building institutional and human resources capacities in agricultural research, extension and education, including the establishment of efficient information and communication systems linking rural populations, institutions, and the public and private sectors.

¹ Agricultural extension was once known as the application of scientific research and new knowledge to agricultural practices through farmer education. The field of extension now encompasses a wider range of communication and learning activities organized for rural people by professionals from different disciplines, including agriculture, health, and business.

² Semi-subsistence farms are those in which both domestic use and sale account for significant proportions of the farms' output. These are typically relatively small-scale (non-intensive).

10. ***Agricultural and rural policies.*** A key to improving sustainable development has been the continued adjustment of countries' agricultural and rural policies. National Sustainable Development Strategies with particular emphasis on agriculture and rural development issues, and/or Agricultural and Rural Development Strategies with a focus on sustainability, have been put in place in the vast majority of UNECE member States. Based on these strategies, numerous policy interventions, laws, regulations, directives, and action plans have been implemented, notably in the more prosperous countries of the region.
11. In most countries, agricultural and trade policies have been and continue to be in a process of reform. This process has been mostly driven by budgetary costs of the traditional agricultural and trade policies that aimed at supporting agricultural incomes by means of agricultural producer price support. Additional drivers of the reform process have been the Agreements on Agriculture under the World Trade Organization (WTO) and the declining public acceptance of these policies.
12. In the course of these reforms, producer support prices have been lowered and other forms of government market intervention have been reduced. In addition, direct government payments have been introduced, and agricultural policies have become greener in the sense that environmental aspects and sustainability issues have become more prominent in agricultural practice. Also, an increasing proportion of public outlays for agriculture tend to be earmarked for sustainable rural development rather than just for farming activities.
13. The introduction of certain policy amendments has contributed to progress towards sustainable development. Environmental policies have been increasingly integrated in agricultural as well as rural policy monitoring, analysis, planning, formulation and enforcement. For example, Strategic Environmental Assessments (SEAs) are regularly integrated into decision-making processes in much of Western and Central Europe and North America. These SEAs focus on identifying both the potential negative as well as positive environmental impacts of proposed agricultural and rural policy.
14. In almost every country in the region (with the exception of some EECCA and SEE countries), good agricultural practices³ have been adopted as part of government efforts to enhance sustainable food production and food security and promote environmentally safe agriculture. Positive results, e.g. a meaningful reduction of fertilizers and plant protection chemicals applied, can already be seen in some countries.
15. In transition economies, policy developments are quite diverse. In a number of countries, the lack of institutional capacity still hampers implementation of targeted agricultural and rural development policies and support programmes. Most EECCA and SEE countries have implemented agricultural and trade policies that employ government market intervention in agriculture to alleviate the pressures for structural adjustment and to assure some self-sufficiency in food production.

³ For the concept of Good Agricultural Practice (GAP), see the Food and Agriculture Organization of the United Nations website: <http://www.fao.org/ag/aGp/agpc/doc/themes/5g.html>.

16. In some EECCA countries, property rights to land and other resources need to be clearly established through the entitlement of ownership rights. The lack of well-functioning land markets hinder farmers from making economically promising and environmentally safe investments in land, facilities and equipment. Improving credit markets is of utmost importance, and capacity-building is essential. Extension systems seem to be inadequate or insufficient, and farmers lack technical assistance in most EECCA and SEE countries. Given the poor educational background of many farmers, vocational training needs to be improved and education must be broadly implemented to enable farmers to sustainably overcome low productivity and profitability. Since poor economic performance makes farmers less motivated to take environmental factors into account, considerable progress is needed in this area.

17. **Bioenergy.** Agricultural and rural policies have also responded to increasing prices of fossil energy and growing public concerns about climate change. Programmes aimed at the more efficient use of energy in rural households and enterprises and increasing the production of biofuels from agriculture have been implemented, and substantial financial support is now being provided to farmers for the production of bioenergy, e.g. in the EU. Measures being undertaken include subsidies and investment support for the production of bioethanol, biodiesel and biogas. The Global Bioenergy Partnership hosted by the Food and Agriculture Organization of the United Nations (FAO) has published a comprehensive review on the current state of bioenergy development in G8 + 5 countries⁴.

18. The rapidly growing importance of agricultural bioenergy production raises a number of concerns from a sustainability point of view. One is that bioenergy is often produced from high-input crops well suited for highly mechanized, large-scale production systems, e.g., maize for bioethanol or oilseeds (rapeseed, sunflowers) for biodiesel. More acreage allotted to such crops can amplify problems of soil erosion and water availability. Another concern is that the growing production of energy crops diverts agricultural land and other resources from food production. At the same time, bioenergy production can present an opportunity for marginalized areas and for small-scale production systems, if the right mix of policies and incentives is used.

19. Recent price hikes in agricultural commodity markets can to a large degree be attributed to the increasing importance of energy crops. High food prices are a major problem for at least two reasons. One is that they will significantly increase the number of malnourished humans. A second is that sustained high food prices globally increase the incentives for deforestation and other land-use changes, thus at least offsetting some of the mitigating effects on climate change made by increasing production and consumption of bioenergy.

20. The expansion of sustainable bioenergy may lead to significant investments in rural development. FAO is currently working together with its member countries in three world regions to

⁴ FAO, A review on the current state of bioenergy development in G8 + 5 countries. Rome, 2007. Downloadable from: <http://www.fao.org/docrep/010/a1348e/a1348e00.htm>.

develop good practice for mainstreaming food security and environmental concerns into bioenergy projects, policies and regulations, where appropriate.

21. ***Agriculture and climate change.*** Agriculture and climate change are closely related for at least two further reasons. First, global warming may increase agricultural production in some parts of the UNECE region, while in other areas, the opposite phenomenon is likely to occur due to changing weather patterns. Yield fluctuations and biomass production in arid rangelands can be expected to have a negative effect on agricultural production. On a global scale, and most likely in many developing countries, pressure on land and water resources will increase and food production will probably decline due to climate change. Even in the absence of global warming, the developing countries' net food imports are likely to increase dramatically, as current population growth in these countries is outrunning growth in food production under any scenario⁵. Without any change in policies, the UNECE region will remain one of the net exporters of food, thus covering the global gap. Certainly, in some of the transition economies, agriculture has a particularly significant and underutilized potential to contribute both to world food security and global bio-energy production, e.g. Kazakhstan and Ukraine. For world food security, it is therefore critical that these and other countries quickly realize their full food production potentials.

22. A second factor linking climate change and agriculture is the fact that agriculture is an important source of greenhouse gas (GHG) emissions. Farming accounts for 14 percent⁶ of the global anthropogenic contribution to climate change. When livestock rearing is included, the agricultural sector accounts for about one fifth of all anthropogenic emissions. Crop and pasture expansion are drivers of deforestation; when combined, agriculture and deforestation account for almost one third of the global climate effect. The agricultural sector of UNECE member States is a significant source of global GHG emissions. This has led to proposals for reducing crop- and livestock-induced GHG emissions in the region. Few such measures, however, have been implemented to date. In some EU countries, agricultural investment programmes facilitate emission reduction by changing the conditions for eligibility to receive respective subsidies. Nevertheless, the drop in agricultural GHG emissions, namely of methane and nitrous oxide, is still too low, underlining the need for further substantial reductions.

23. ***Integrated Rural Development Concepts.*** Agriculture is only part of the larger economy in rural areas. The trend towards globalization of world markets, significant changes in consumer preferences worldwide, new policy schemes and environmental damage, as well as the steady aging of the rural population in the UNECE region, not only affect agriculture but rural development in general. Rural areas in almost every UNECE member State are in a process of deep structural adjustment. Against this background, national programmes for integrated concepts, i.e. towards more sustainable local- and community-related development, strengthened rural infrastructure, greater diversity in the rural economy and improved access to markets have been formulated and

⁵ FAO, *The State of Food and Agriculture 2007*. Rome, 2007. Available at: <http://www.fao.org/docrep/010/a1200e/a1200e00.htm>.

⁶ For more information, see *The Stern Review on the Economics of Climate Change*, Cambridge, U.K., Cambridge University Press (2006).

implemented in recent years in many countries. Countries in the region, especially in the EU, are already applying a more holistic approach to rural and remote area development. In other countries (e.g. Canada) an increasing share of agricultural support is shifting away from farming towards general economic activities in rural areas.

24. In many countries of the region, especially in the ones with lower GDP per capita, agricultural ministries and related institutions do not yet have the capacity to administer complex and consistent rural development programmes. Capacity-building in this regard is particularly crucial for the further development of rural economies.

B. Challenges ahead and necessary next steps

25. Despite some remarkable progress made with respect to sustainable development in recent years, there is still considerable room for improvement. Agricultural and rural actors face challenges in at least four key areas:

- (1) Agricultural and Rural Policy;
- (2) Economic Framework Conditions;
- (3) Climate Change: Adaptation and Mitigation;
- (4) Bioenergy.

26. ***Agricultural and rural policy.*** The agricultural and rural policy framework needs targeted adjustments in some countries and broader reforms in others. More liberalized and harmonized agriculture and trade policies constitute a crucial instrument for further region-wide and global economic growth, which itself is a prerequisite for global sustainable development. UNECE member States should therefore be at the forefront in reducing trade-distorting and welfare-decreasing tariff and non-tariff barriers. Additional fair, strong and justifiable trade policy commitments in the framework of WTO and regional Free Trade Agreements are needed to allow for greater poverty reduction.

27. In parallel, for better policy integration, a restructuring of ministerial and administrative structures and a strengthening of the capacity of respective governmental institutions needs to be achieved in a number of countries.

28. ***Economic Framework Conditions.*** As world food supply growth has outstripped the growth in demand, the long-term trend in real world market prices of agricultural goods has been declining in recent decades. Both global and UNECE agriculture during this period produced more food for more humans at declining prices. This long-term trend in food prices has now begun to change. World food prices appear to be increasing, albeit with some rather pronounced fluctuations around this general trend.

29. Growth in demand can be expected to be rapid in the decades ahead because of continued population growth and the remarkable per capita income increase in many developing countries.

World food supply, however, is likely to grow more slowly than demand. There are several reasons for this. One is that the acreage available for food production is limited. Another is that the annual productivity growth in agriculture, globally and especially in the UNECE region, continues to decline.

30. Against this background, one challenge is the adaptation of production systems. The increasing world population, changing dietary preferences and the increasing demand on biomass for bioenergy production are creating pressure on land and other resources to produce more agricultural raw materials. Within the UNECE region, this cannot be achieved by bringing more land under cultivation; the most productive soils are already being farmed. In many countries, there are no major land reserves that could be mobilized for farming, and forests or other ecologically valuable land is protected for environmental reasons. Instead, it is extremely important to shift land use towards more environmentally friendly crops and livestock raising and to focus on technologies and plants that can improve yields per ha and head of livestock. This requires modern equipment, improved knowledge, increased investment and innovative economic thinking.

31. A second challenge is to provide the necessary scientific information for good entrepreneurial decision-making and beneficial management practices. Given dramatic shifts in market demands, farmers and rural entrepreneurs need to receive data more efficiently and faster. Information channels have to be established and continuously updated to broaden the understanding of sustainability and means to achieve it. Complementary research and development is needed to invent, develop and implement new techniques and technologies as well as management tools to improve the overall health of natural resources, e.g. less polluted air, water and soils; reduced water, wind and tillage erosion; decreased soil salinization, increased carbon content in soils. Better soil quality, for instance, can be achieved via the application of a number of farming practices, e.g. the addition of organic materials to maintain soil cover and structure, conservation tillage and crop rotations. Better water quality can be achieved if nutrient applications better meet crop needs and if the storage and handling of manure and chemicals is improved.

32. The implementation of new technologies requiring further capacity-building constitutes a further challenge. Education and training has to provide farmers and other economic actors in rural areas with the necessary entrepreneurial and technical skills to maintain sustainable farming in a business environment that is growing increasingly risky. In most cases, the myriad of environmental and economic challenges facing rural areas are unique to a specific rural region. Therefore, subregional and local sustainable development strategies need to be formulated and implemented. The different sectors of the rural economy, society and environment have to be integrated to bring about private and public advocacy of sustainable endogenous development of rural areas.

33. ***Climate Change: Adaptation and Mitigation.*** Another key for future sustainability will be how the UNECE region is able to cope with climate change adaptation and mitigation with respect to agriculture and the rural economy. Specific agricultural and rural adaptation strategies need to be developed. However a number of questions need to be answered, namely: What adaptation options in the area of farm production practices are technically feasible and economically viable? What is the feasibility of and timetable for producing alternative crops in different areas as the climate changes?

Which factors constrain adaptation? What opportunities exist for synergistic benefits? How can adaptation issues be integrated into management strategies and agricultural and rural policymaking?

34. Issues of climate change have recently been included in adaptation and mitigation strategy development in the UNECE region. But policy answers are still missing to a large extent, and the tasks remain considerable: agricultural and rural mitigation needs to be improved, especially taking into account the increasingly ambitious targets for reducing overall GHG emissions taken up by some UNECE member States. Better knowledge about regional climate change and its impacts on agriculture should lead to regional strategies to combat (in the case of a negative impact) or use (in the case of a positive impact) these impacts by adapting existing systems. Nonetheless, a considerable amount of research is still needed.

35. UNECE member States need to show a keener interest in reducing agricultural GHG emissions and also in enhancing carbon sequestration, for instance by developing proper farming and management practices as well as policy interventions. A credible and successful climate policy has to be comprehensive. Agriculture has therefore to be integrated into the overall political strategy for the mitigation of GHG emissions. Indeed, agriculture's potential for GHG emissions' mitigation is high and the costs of mitigation are probably low. However, this potential has not been realized. Suitable mitigation instruments should include incentive-based measures (e.g. tradable emission permits) as well as consumer information about the climate effects of agriculture.

36. **Bioenergy.** The increased production and use of renewable energy is seen as a key factor for mitigating GHG emissions. This is amplified by the rapidly increasing importance of bioenergy production, in particular in the EU, Canada and the United States. As a consequence, the friction between world food security and growing bio-energy production seem to be increasing, but it can be ameliorated. In many countries of the UNECE region, there is agricultural land that is laying idle, often as the result of agricultural policy programmes. A discontinuation of set-aside programmes (already initiated in the EU) has the potential to significantly increase bioenergy production.

II. DROUGHT

A. Progress achieved and existing problems

37. Globally, the last decade has been characterized by an increasing frequency of extreme weather and climate events, including droughts and water scarcity. Certain European⁷ and Central Asian⁸ countries have been increasingly affected by drought.

⁷ The European countries in this context are: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Georgia, Greece, Hungary, Italy, Latvia, Lithuania, Malta, Moldova, Poland, Portugal, The former Yugoslav Republic of Macedonia, Turkey and Ukraine.

⁸ The Central Asian countries in this context are: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan.

38. Because precipitation deficits usually first appear as deficits in soil water, agriculture is often the first sector to be affected. They also have a direct impact on economic sectors which use and depend on water, such as tourism, industry, energy and transport. Furthermore, inadequate water allocation between economic sectors results in imbalances between water needs and existing water resources. Water scarcity and droughts also have broader impacts on natural resources in general through negative side-effects on biodiversity, water quality, increased risk of forest fires and soil impoverishment.

39. ***Drought risk management.*** In the European and Central Asian countries, drought severity depends on its impact on local people, economies, and the environment and on their ability to cope with and recover from it. Therefore, a comprehensive approach towards drought risk management, including a drought monitoring system, mitigation and preparedness must be set up to address this issue both subregionally and locally. The goal of drought risk management is to increase the capacity of society to cope with drought, leading to a greater resilience and reduced need for government or donor interventions in the form of disaster assistance.

40. At EU level, over the past 30 years droughts have dramatically increased in number and intensity⁹; there is a need to foster exchanges of information and good practices on drought risk management and to address the challenge of water scarcity and droughts – not only as an essential environmental issue, but also as a sustainable economic growth and climate change issues – as well as to further explore the improvement of water efficiency and the development of water saving culture.

41. In South-East Europe (SEE)¹⁰ SEE, available meteorological, hydrological and agricultural data show that droughts are a part of the climate cycle as well as floods. The severe droughts which occurred there during the last decades caused significant socio-economic damage in different sectors; notably, drought-related forest fires were costly for agriculture and loss of human life. Recognizing a predictable increase of drought occurrence, frequency and impacts, the SEE countries are attaching increasing importance to national and as subregional efforts in drought management. In 2006, in cooperation with the United Nations Convention to Combat Desertification (UNCCD) secretariat and the World Meteorological Organization (WMO), the SEE countries established a Drought Management Centre for South-Eastern Europe that will integrate input from the UNCCD focal points, representatives of the national Meteorological and Hydrological Services, and national drought researchers from each participating country. The aim is to develop a subregional drought management strategy, implement an effective drought monitoring and early warning system, provide reliable and timely information to national decision makers, and share information and lessons learned. The UNCCD also addresses the issues of drought mitigation through the National Action Programmes (NAPs) to combat desertification, which could include relevant national drought strategies and which can be complemented by Subregional Action Programmes.

⁹ http://ec.europa.eu/environment/water/quantity/scarcity_en.htm.

¹⁰ The SEE countries in this context are: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, The former Yugoslav Republic of Macedonia, Greece, Hungary, Republic of Moldova, Romania, Slovenia, Turkey, Montenegro, and Serbia.

42. In Central Asia in the past few decades, droughts have increased poverty, decreased food security, and caused migration. Furthermore, water stress is expected to worsen in the subregion with the melting of the glaciers and climate change. Central Asian countries have prepared a Subregional Action Programme on Combating Desertification in Central Asia within the context of the UNCCD, in which mitigation of the effects of drought is an important element.

43. These countries are also currently preparing measures to enhance the implementation of the UNCCD in the context of drought preparedness, monitoring and management.

B. Challenges ahead and necessary next steps

44. *From crisis management to drought risk management.* Since drought-affected areas are likely to increase in the European and Central Asian countries, it should become a regional priority to move from crisis management to drought risk management. A wide range of policy options will therefore need to be considered. As water is necessary for all human, economic and social activities, challenges ahead would include, inter alia, moving towards a water-efficient and water-saving economy at all levels.

45. *Drought preparedness and assessment.* Despite increased societal vulnerability to drought in the European and Central Asian countries, national and subregional assessment and monitoring capacities have not yet been provided with the additional resources necessary for more accurate forecasts and assessments to aid in the early identification of drought events and the provision of appropriate coping strategies. Therefore, developing subregional Drought Management Centres in the European and Central Asian countries that involve end-users will be a challenging but necessary step to improving drought preparedness and building needed institutional capacity at the regional and local levels.

46. *International cooperation on drought issues.* According to the 10-year strategy objectives adopted by the 192 Parties to the UNCCD in September 2007, several steps – which relate to drought issues for all parties, including the European and Central Asian countries which are Parties to the Convention – need to be taken, these include strengthening the existing institutions responsible for education and training in affected countries, where appropriate; harmonizing programmes and organizing exchanges of experience; promoting technical and scientific cooperation in the fields of drought mitigation through appropriate national, subregional or regional institutions. The countries should also promote, finance and/or facilitate the financing of the transfer, acquisition, adaptation and development of environmentally sound, economically viable and socially acceptable technologies relevant for the mitigation of the effects of drought.

III. COMBATING DESERTIFICATION AND LAND DEGRADATION

A. Progress achieved and existing problems

47. Desertification¹¹ is the degradation of land in arid, semi-arid and dry sub-humid areas. Land degradation means, in particular, reduction or loss of the biological or economic productivity and complexity of rain-fed cropland, irrigated cropland, or range, pasture, forest and woodlands resulting from a number of processes, including human activities and habitation patterns.

48. *Desertification and land degradation in the UNECE region.* It should be clearly noted that desertification and land degradation are not only a problem for the developing countries, as developed European countries are not less affected. The countries that have a status of officially affected under the UNCCD process are: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Georgia, Greece, Hungary, Italy, Kazakhstan, Kyrgyzstan, Latvia, Malta, Portugal, Moldova, Romania, Russian Federation, Slovakia, Slovenia, Spain, Tajikistan, The former Yugoslav Republic of Macedonia, Turkey, Turkmenistan, Ukraine, and Uzbekistan.

49. The particular conditions of the Northern Mediterranean region¹² include: poor and highly erodible soils, prone to develop surface crusts; uneven relief with steep slopes and very diversified landscapes; extensive forest coverage losses due to frequent wildfires; crisis conditions in traditional agriculture with associated land abandonment and deterioration of soil and water conservation structures; unsustainable exploitation of water resources leading to serious environmental damage, including chemical pollution, salinization and exhaustion of aquifers; and concentration of economic activity in coastal areas as a result of urban growth, industrial activities, tourism and irrigated agriculture.

50. The particular conditions of the Central and Eastern European region¹³ include: specific problems and challenges related to the current process of economic transition, including macroeconomic and financial problems and the need for strengthening the social and political framework for economic and market reforms; the variety of forms of land degradation in the different ecosystems of the region, including the effects of drought and the risks of desertification in subregions prone to soil erosion caused by water and wind; crisis conditions in agriculture; the risks of growing economic hardships and deteriorating social conditions in areas affected by land degradation, desertification and drought; the need to review research objectives and the policy and legislative framework for the sustainable management of natural resources; and the opening-up of the region to wider international cooperation and the pursuit of broad objectives of sustainable development.

¹¹ In accordance with the provisions of the UNCCD.

¹² Northern Mediterranean countries in this context include countries under annex IV of the UNCCD.

¹³ Central and Eastern European countries in this context include countries under annex V of the UNCCD.

51. In Central Asian countries, more than a half of the land is highly susceptible to desertification and land degradation and is already highly affected. The ongoing process of radical socio-economic reform – including decentralization, privatization and improved access to information for ordinary citizens – and land reform has direct or indirect implications for environmental protection. Given that the majority of the Central Asian population lives in rural areas, the impact of land degradation is taking a high toll on the quality of life.

52. ***Progress in combating desertification and land degradation.*** The National Reports on implementation of the UNCCD prepared by the affected Parties that provide the latest information¹⁴ on progress achieved and problems remaining in the affected countries in the field of combating land degradation, desertification and mitigating the effects of drought showed that they have some common features.

53. All affected countries are gradually recognizing the importance of issues of land degradation and desertification for sustainable land management. This trend is confirmed by a growing number of affected countries that have prepared NAPs as a main instrument for combating desertification and land degradation. Fourteen countries¹⁵ have already prepared NAPs; other affected countries are in the process of preparing or finalizing them.

54. There is a general growing understanding that a bottom-up approach is of crucial importance in combating land degradation and desertification. However, while overall there is noticeable progress in particular in the light of implementation of the Aarhus Convention¹⁶, countries seem to find it difficult to organize a decision-making process in a truly participatory way, particularly in places where local communities are not adequately empowered and motivated by the decision makers.

55. Improved environmental legislation is important in safeguarding sustainable land management and combating desertification. In the EU, affected countries' legislation and strategic frameworks contribute to improving national institutional and legislative frameworks, particularly for soil, water, and agriculture issues. Gradually, progress is being made in developing national legislation and strategies specifically addressing land management and combating desertification.

56. There is a common understanding that only with a serious increase in financial resources can appropriate technology and staff be mobilized to create systems to assess, monitor and mitigate the effects of land degradation and desertification. For many affected countries these constraints are resulting, in particular, from the low priority of land degradation and desertification in budgetary financing, as well as the diversion of resources allocated to combat land degradation and desertification to other urgent activities. Policy debates on and activities aiming at the involvement

¹⁴ All National Reports are available on www.unccd.int.

¹⁵ Armenia, Georgia, Greece, Italy, Kazakhstan, Kyrgyzstan, Moldova, Portugal, Romania, Spain, Tajikistan, Turkey, Turkmenistan and Uzbekistan.

¹⁶ The Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters.

of the private sector should be promoted to systematically tap financial resources for combating desertification and mitigating effects of drought.

57. The improvement of scientific knowledge, in particular indicators and monitoring systems and land rehabilitation techniques, is strongly supported by European Commission-funded research projects and, in some cases, nationally funded research projects from EU countries. Their results could be more widely applied in many affected countries, in particular with respect to developing information systems on best practices and traditional knowledge and establishing a coherent regional system of benchmarks and indicators related to desertification.

58. The importance of exploring sustainable livelihoods in areas affected by desertification, e.g. through organic agriculture, carbon sequestration and sustainable land management, is being recognized. Furthermore, more scientific research on economic and social aspects of land degradation, drought and desertification is needed.

59. Development of transboundary, subregional and regional cooperation among affected countries is steadily growing under the UNCCD regional processes. Noticeable success was made in 2003, when the affected countries from the Northern Mediterranean and Central and Eastern Europe regions reached agreements on developing elements for platforms of cooperation to combat desertification and land degradation.

60. Also in 2003, the Central Asian countries adopted the Subregional Action Programme for the Central Asian countries on Combating Desertification (SRAP/CD) within the context of the UNCCD. While priority areas and instruments for developing subregional cooperation were agreed upon for the SRAP/CD, a lack of financial resources is hampering the implementation process.

B. Challenges ahead and necessary next steps

61. Although progress relating to combating desertification and land degradation has been made by affected countries in the past years, there are still possibilities for further improvements. These could also be considered in the light of certain challenges ahead such as; managing the interlinkages between desertification, climate change and biodiversity; moving from crisis to risk environmental management; and integrating the socio-economic costs of desertification in the policy framework.

62. *Addressing the interlinkages between desertification, climate change and biodiversity.* Land degradation and desertification generally induce a loss of topsoil, in quantity and/or in quality, which has extreme consequences on the vegetation, the biodiversity, the landscape and the climate. A particular challenge will be maintaining or rehabilitating a high level of organic matter in the soil. There is a critical need for better monitoring of the organic matter of soil, which is threatened by degradation processes such as erosion, contamination, sealing, compaction and salinization, as well as for developing a coherent, standardized and harmonized approach to improving the fertility of soil.

63. At the global level, there is a complex interaction between the soil and climate change due to soil's role in carbon sequestration and its impact on the variation of biomass. In turn, the consequences of climate change affect soil properties and performance. The formulation and management of integrated local area development programmes on afforestation in the affected countries could contribute to combating desertification and mitigation of climate change. In several affected countries, new afforestation projects to combat land degradation and desertification could be designed under the Clean Development Mechanism with an integrated approach taking into consideration local communities and their well-being. Due to the fact that all affected countries belong to various United Nations Framework Convention on Climate Change (UNFCCC) classifications, a challenge will be to consider developing a common cooperation framework for combating desertification and mitigating or adapting to climate change.

64. ***The socio-economic costs of desertification.*** The economic and social costs of desertification and degradation have unfortunately been underestimated and are not known with accuracy because of the difficulties to measure them. Desertification impacts food security, livestock markets, sustainability of natural resources with the intensification of conflicts over access to them as well as over land ownership, water rights, trade. Unemployment, decreased human health, population migration from rural to urban areas, or to other neighbouring farming lands or countries are also consequences of desertification. A challenge will be to effectively use the lessons learned from comparing the cost of inaction to the costs of concrete actions to combat desertification and land degradation.

65. ***International policy frameworks to combat desertification and land degradation.*** The provisions of the UNCCD provide an international framework for combating desertification and improving sustainable land management in the countries declaring themselves as affected countries under the UNCCD (Northern Mediterranean, Central and East European, and Central Asian countries). The new 10-year strategic plan and framework to enhance the implementation of the UNCCD (2008–2018) will guide the actions of all stakeholders and partners in the short and medium term¹⁷.

66. The planned Soil Framework Directive of the European Community is an important step towards soil protection for all EU countries, whether affected or not under the UNCCD framework. The Directive aims at the establishment of a common strategy for the protection and sustainable use of soil, based, inter alia, on the principles of integrating soil issues into policy decisions, promoting the preservation of soil functions within the context of sustainable use, and preventing threats to soil and mitigating their effects, as well as restoring degraded soils.

67. A harmonized and concerted regional campaign for soil protection, addressing all affected countries, would be needed for discussion not only of land degradation and desertification, but also of soil fertility and organic matters as a common “public good”.

¹⁷ For details on the UNCCD 10-year strategic plan and framework, see the UNCCD website at: <http://www.unccd.int/cop/officialdocs/cop8/pdf/10add2eng.pdf>.

68. Taking into account the wealth of scientific experience available in many affected countries, it might be useful to consider how to establish a regional framework for exchange of experience and good practices between all interested countries.

IV. SUSTAINABLE MANAGEMENT OF LAND RESOURCES

69. Historic developments and existing infrastructures in the countries of the UNECE region define a broad range of different land management practices and approaches. Notwithstanding this diversity, the following sections highlight progress achieved as well as challenges and lessons in land management and land-related environmental pollution.

A. Progress achieved and existing problems

70. *Land Management.* Sustainable land management is based on a sound system of land administration, which ensures that information on the ownership, value and use of land and land plots is properly recorded, surveyed and disseminated. Only on this basis, a more comprehensive and sustainable land management, taking into account economic, social and environmental impacts of different types of land-use and land development measures, can be pursued.

71. Land administration systems are being constantly modernized, particularly in the EU countries as well as in Canada and the United States. This mostly involves the systems' digitalization (electronic lodgment and land transfer) achieved at various levels of complexity in line with the move towards e-government. In countries such as Norway, Sweden and the United Kingdom, computerized transactions have become the norm. Land evaluation methods have become more sophisticated with the use of geographic information systems (GIS) and information technology. Countries in the UNECE region make use of advanced single and mass property valuation methods. The latter form the basis for the introduction of property taxes in the real estate sector. In some countries (e.g. Finland and Sweden), real property information, as well as data on ownership, property valuation and taxation, is combined in unified cadastral systems. In others (e.g. Germany and Spain), dual systems have evolved over time on different technical platforms.

72. In most transition countries, Governments have privatized land with various degree of success. Many countries have maintained State ownership over natural reserves, areas of strategic importance and land needed for transport infrastructure and oil and gas pipelines. On the other hand, land tenure transformation has been widespread, particularly in the EECCA countries, where private ownership over land was almost non-existent. Some transition countries have used privatization as an opportunity to introduce up-to-date cadastre and land registration systems, while in others this process is still lagging behind. Incremental steps towards the development of land administration systems in some countries (e.g. Serbia and Albania) have also set the stage for property restitution and the privatization of agricultural and urban land.

73. Across the UNECE region, Governments have promoted the practical implementation of good land administration in terms of creating functioning markets for land and real estate. In most transition countries, land market reform has been carried out with corresponding changes in the legal, financial, institutional and technical aspects required for successful land administration and management. In some countries (e.g. Lithuania and Moldova), the new unified cadastre system offers a complete coverage of urban and rural land as well as real estate. Substantial progress has been achieved in the management of physical land resources—agricultural land, wetlands and protected environmental areas, natural habitat and urban land. Integrated approaches to environmental urban management, promoted through cross-national spatial planning policies, have contributed to territorial cohesion and better management of physical land resources.

74. A notable achievement is the move towards a broader concept of spatial data frameworks. These spatial data infrastructures allow data exchange across thematic, judicial and administrative boundaries in the EU Member States, extending the services to 32 countries, and adding another cross-national layer to the comprehensive environmental monitoring systems. Furthermore, EU policies on territorial cohesion are a significant driver towards a consolidated approach to better land management and protection of land resources. The newly endorsed Leipzig Charter on Sustainable European Cities (May 2007) also provides a strategic framework for action in areas of sustainable land management, sensitive urban-rural interface, and integrated spatial planning to counteract urban sprawl.

75. ***Land degradation and pollution.*** Certain efforts have been undertaken to address the problems of land degradation and contamination of land in the EECCA region. For example both Belarus and Ukraine have been applying measures to minimize the effects of the Chernobyl accident, including restrictions on agricultural and other activities in the contaminated zones and monitoring of radioactivity levels. With the help of international donors, some EECCA countries have made assessments of contaminated areas from past pollution, including mine tailings, storage sites for hazardous waste near industrial facilities, and storage sites for obsolete pesticides. This baseline data can then be used to establish monitoring systems assisting in defining policy intervention.

76. In the EU, land use-related challenges are becoming more and more important and visible, partly as a result of increased climate variability, leading to increasing frequency of heavy rainfall events with the resulting problems of soil erosion, flooding and pollution of agricultural cropland. EU farmers thus far have mainly responded to economic pressures reducing the tillage intensity and cost, but to address these environmental problems, major changes in soil agricultural land and soil management are required. New upcoming EU legislation on soil management and the new EU Water Directive are likely to increase pressure on agriculture to make more drastic changes in soil management. So far, permanent no-tillage cropping systems (“Conservation Agriculture”), have been only applied by a minority of European farmers. Over the past five years, Finland has reached a 20-per cent adoption of permanent no-tillage farming, Switzerland provides government incentives for conservation agriculture and has a relatively strong farmers’ movement applying no-tillage farming, of about 13,000 ha. Further validity of the this cropping system in Europe is evidenced by France’s small but well-established Conservation Agriculture farmers’ movement and Spain’s

significant adoption of no-tillage farming. If the concept of no-tillage farming is still little known in other parts of Europe, this may change with the new legislation. The German Federal State of Saxony, which in the past years has been heavily affected by flood events, has studied the effects of no-tillage farming on water infiltration and flood prevention. As a result, the State is now only providing support to those farmers adopting no-tillage systems, since these are the only ones who would contribute to environmental services in adherence with the new EU water directives.

B. Challenges ahead and necessary next steps

77. Despite progress in most countries in the UNECE region, significant challenges in land administration and land management remain: (a) the establishment of modern land administration systems is still incomplete; (b) control over the implementation of land policy is ineffective; and (c) the institutional set-up and capacities are inadequate.

78. *Modernization of Land Administration and Implementation of Land Policies.* The institutional evolution of land administration in countries in transition reflects historical and political developments. As the land reforms are embedded in multiple transitions – to markets, democracy and decentralized governance – it is no surprise that there are conflicting goals, overlapping responsibilities and fragmentation of services. The lack of transparency in the land privatization process, coupled with inefficient institutional set-up for land administration, spatial planning and enforcement of planning and building permits, has created a complex series of problems manifested in illegal construction and development in large urban centres in EECCA and SEE countries. Even in countries where reforms are relatively advanced, informal transactions take place and bureaucratic delays contribute to inefficient land and real estate markets. These challenges, surprisingly, are found in some countries in the UNECE region with mature land markets and well-established institutional frameworks for land management. The presence of illegal buildings in Southern Europe, for example, also points to the unresolved complexity of access to urban land and housing in Greece, Portugal and Cyprus.

79. In the context of transition, restitution of nationalized rural land to its previous owners has been one of the privatization measures in SEE and the Baltic States. The process has faced difficulties and resulted in serious backlogs in the processing of land claims. In most of the EECCA countries, Governments have adopted mass privatization strategies resulting in the quick transfer of land to private owners. In some countries (e.g. Georgia and Uzbekistan) agricultural land was privatized as an urgent measure in response to poverty and hunger. In others, land markets cannot work efficiently because the land reform has not been completed. For example, in Ukraine there is a moratorium on sale of agricultural land due to an incomplete legal framework.

80. Another challenge related to the land restitution and privatization is its contribution to the shortage of land in urban growth areas. These developments are accompanied by the occupation of agricultural land in the urban periphery and the growth of illegal settlements, where the combination of inefficient administrative systems and urban poverty creates a cycle of economic and social deprivation (e.g. Tirana, Tbilisi and Yerevan). Furthermore, the dysfunctional land cadastre and

registration systems and/or weak public administration in some EECCA countries continue to keep transaction costs artificially high for households and businesses.

81. The further consolidation and modernization of land administration systems is a major challenge, particularly in transition countries, i.e. dealing with the adverse consequences of land privatization, not fully implemented land policies and scattered land holdings.

82. In a number of countries, a transition to a more comprehensive land management can be observed, whereby land is put to good effect across different types of land use. Land management tools – e.g. land consolidation and land reallocation, integrated with spatial planning and other policy areas such as infrastructure and transport – can be effective means for the revitalization of rural areas and the restoration of the rural-urban balance. At the same time, their implementation requires complex institutional cooperation across all government levels, as well as citizen participation.

83. *Environmental Challenges.* Within the land privatization process in the transition countries, environmental concerns have often not been taken into account. In Moldova, for example, forest protection belts and water protection zones are often privatized, and there is little control and enforcement of their proper use. Many countries experience significant land degradation. Anti-erosion measures, such as optimal crop rotation, terracing and planting of forest protection belts are applied less than before. In Tajikistan, it is estimated that over 80 per cent of all land suffers some level of erosion. Poor land management practices, such as cultivation of land on steep slopes, excessive and often the illegal cutting of forest and bushes, overgrazing and improper irrigation exacerbate natural erosion. Water and wind erosion are the predominant types of land degradation in Ukraine, affecting a total of 57 per cent of country's territory.

84. Improperly stored obsolete pesticides also remain an unresolved problem in many countries. Even where inventories of such sites have been developed, countries often lack the financial resources for their safe disposal and/or storage. This is also true for implementing measures to clean up areas contaminated with hazardous waste, particularly when the ownership of industrial facilities that created such areas changed hands during the process of privatization.

C. Lessons learned

85. The experience of the countries in the UNECE region highlights important lessons in the priority areas described above.

86. First, building effective and enduring land administration systems requires long-term investment. Despite the relatively high costs of creating and maintaining land administration systems, the benefits of more transparent and competitive land markets and better managed land resources are fundamental to economic prosperity and socially equitable public policies.

87. Second, the successes and failures of land administration reforms are to a large extent attributable to countries' institutional frameworks. Significant effort and resources must be invested

in developing and maintaining the capacities of people and institutions to manage a good land administration system. This is particularly essential for the EECCA and SEE countries, which face considerable institutional and financial challenges.

88. Third, environmental concerns need to become an integral part of efficient and effective land management, particularly in the EECCA and SEE countries. Legal frameworks need to be improved and proper enforcement and compliance ensured to address the problems of land degradation and contamination. The countries of the region should explore a range of possibilities to attract funding from both domestic and international sources, as well as capitalize on the transfer of good practices in land management and environmental monitoring from the developed countries of the UNECE region.
