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Policy options and actions for expediting progress in implementation: desertification

Report of the Secretary-General

Summary

The challenges posed by increased desertification, including protecting the livelihoods of the millions of people directly affected by desertification, need urgent attention if sustainable development goals are to be achieved. In addition to addressing the root causes of land degradation, national policies aimed at combating desertification need to take into account the linkages among land degradation, desertification and poverty in an integrated manner.

Policies aimed at improving the productivity of land, reducing soil erosion and reversing salinization trends achieve relatively better results if these are owned by local communities. Promoting regional cooperation in the form of sharing of information, knowledge and best practices will allow positive externality gains to be made. Combining implementation of land administration policies with land planning and management policies will yield quick benefits in terms of promoting sustainable land-use practices and addressing the factors causing land degradation.

Improved land tenure security could encourage farmers to invest in soil and water conservation in agriculture, while building partnerships at various levels may help in realizing much-needed technology transfer and capacity-building to protect the integrity of ecosystems. Also, community-based organizations need to be encouraged to assume greater responsibility for natural resources management.

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I. Introduction

1. At its sixteenth session, the review session of the third implementation cycle, 2008-2009, the Commission on Sustainable Development conducted an evaluation of progress achieved in the selected cluster of issues for the cycle: agriculture, rural development, land, desertification, drought and Africa, as described in Agenda 21,[1] the Programme for the Further Implementation of Agenda 21[2] and the Plan of Implementation of the World Summit on Sustainable Development ("Johannesburg Plan of Implementation").[3] The Commission identified constraints and obstacles as well as new challenges and opportunities with respect to implementation in the selected thematic cluster of issues.

2. At its seventeenth session, the policy session of its current implementation cycle, the Commission will take decisions on policy options and practical measures to expedite implementation in the selected cluster of issues. The session of the Commission will be preceded by its Intergovernmental Preparatory Meeting.

3. The present report is a contribution to the discussions to be held at the Intergovernmental Preparatory Meeting on policy options and practical actions to expedite progress in combating desertification. It responds to the challenges and obstacles highlighted in the report of the Commission on its sixteenth session.[4] The cross-cutting issues, including the means of implementation identified by the Commission at its eleventh session, are addressed throughout the report. The report benefited from inputs received from United Nations organizations, the Secretariat of the United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa,[5] and, in particular, the 2005 Millennium Ecosystem Assessment and the 2007 United Nations University policy brief entitled *Re-thinking Policies to Cope with Desertification*.[6]

4. In this report, the phenomenon of desertification, defined as land degradation in arid and semi-arid areas, is considered to be different from drought as regards the way it is initiated and how it affects the practices leading to sustainable land-use planning and management. Discussion of desertification in this report also differs from that presented in the report of the Secretary-General on land (E/CN.17/2009/5) in order to highlight the environmental causes leading to a major decline in the well-being of millions of people whose livelihoods are attached to drylands. The report should be read in conjunction with the reports of the Secretary-General on

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[1] *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992*, vol. I, *Resolutions Adopted by the Conference* (United Nations publications, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II.

[2] General Assembly resolution S-19/2, annex.

[3] *Report of the World Summit on Sustainable Development, Johannesburg, South Africa, 26 August-4 September 2002* (United Nations publication, Sales No. E.03.II.A.1 and corrigendum), chap. I, resolution 2, annex.

[4] *Official Records of the Economic and Social Council, 2008, Supplement No. 9* (E/2008/29).

[5] United Nations, *Treaty Series*, vol. 1954, No. 33480.

[6] *Re-thinking Policies to Cope with Desertification: Overcoming One of the Great Environmental Challenges of Our Time*, a policy brief based on The Joint International Conference "Desertification and the International Policy Imperative", Algiers, 17-19 December 2006 (Hamilton, Ontario, United Nations University (UNU) International Network on Water, Environment and Health" (UNU-INWEH) 2007).

agriculture (E/CN.17/2009/3), land, rural development (E/CN.17/2009/4), drought (E/CN.17/2009/6) and Africa (E/CN.17/2009/8), which will also be before the Commission's Intergovernmental Preparatory Meeting. Cross-references are made to these reports where applicable.

II. Policies to combat desertification

5. Desertification is emerging as a global-scale environmental crisis affecting millions of people, and posing significant threats to sustainable development in affected countries and regions. As a result of desertification, persistent reductions in the capacity of ecosystems to provide services such as food, water, energy and other basic needs are leading to a major decline in the well-being of people, particularly the poor, living in drylands. Addressing desertification is also a critical and essential part of adaptation to climate change and mitigation of global biodiversity losses.[7] Combating desertification requires policies that link land use and livelihoods to the goals of sustainable development.

A. Improving sustainable land use and livelihoods

6. In the dry sub-humid and semi-arid regions, conditions favour agricultural and pastoral land use equally. Tighter cultural and economic integration of farmers and pastoralists, rather than competitive exclusionary practices, can prevent desertification. Mixed farming practices in these regions, whereby a single farm household combines livestock production and cropping, allow more efficient recycling of nutrients within the agricultural system. Such interactions can lower livestock pressure on rangelands through fodder cultivation and the provision of stubble to supplement livestock feed during forage scarcity and, immediately after, to allow regeneration of vegetation (see box I). At the same time, farmland benefits from manure provided by livestock kept on fields during the dry season. Many West African farming systems are based on this kind of integration of pastures and farmland.[8]

Box I
Sustainable land use and livelihoods in marginal drylands

The Sustainable Management of Marginal Drylands (SUMAMAD)[a] project in Uzbekistan contributed towards improved herd management systems that alleviated the grazing pressure on rangeland, training of local farmers in monitoring land degradation trends and the introduction of native fodder plants aimed at rehabilitation of degraded rangelands. In

[7] Ibid., p. 2.

[8] Millennium Ecosystem Assessment, *Ecosystems and Human Well-Being: Desertification Synthesis* (Washington, D.C., World Resource Institute, 2005), pp. 14-15.

Pakistan, the project focused on soil and water conservation and the establishment of saline fish ponds to diversify income opportunities for dryland communities.

Source: Cathy Lee and Thomas Schaaf, eds. "Sustainable management of marginal drylands: using science to promote sustainable development: project findings from Northern Africa to Asia" (Paris, United Nations Educational, Scientific and Cultural Organization, 2008), pp. 150 and 230.

[a] SUMAMAD was a project of five years duration (2003-2007) that investigated dryland degradation and possible solutions with respect to combating desertification in nine study sites ranging from Northern Africa to East Asia. In-depth studies were carried out with the objective of exploring ways and means to improve the livelihood conditions of dryland dwellers.

7. Pastoralism can be one of the most economically viable and sustainable means of managing the drylands, provided that mobility is an integral part of the management system. Some Governments are increasingly recognizing the value of this approach, and are beginning to accommodate pastoral mobility through various mechanisms, including through policy, investment, legal support, governance and service delivery. Throughout Africa and Asia, training and support in the area of animal health have enhanced pastoral mobility.[9] In the Islamic Republic of Iran and Mongolia, for example, Government investments in appropriate service delivery have contributed to education and capacity-building of pastoralists, better enabling them to increase animal production. They have also increased the capability of pastoralists to operate in markets and avail themselves of a greater range of options for complementary income-generation and non-pastoral employment.

Box II
China's sustainable land management policies in desertification-affected drylands

The system of policies established to promote sustainable land management in desertification-affected drylands is classified into restrictive, incentive and guarantee policies. Restrictive policies include the restricted harvesting of natural medicinal herbs in fragile dry areas, prohibition of open grazing in degraded grassland, and prohibition of fuelwood collection in degraded drylands.

Incentive policies include taxation exemption on agricultural and forest products in desertification-affected areas, concessional loans for desertification rehabilitation activities, and subsidies for readjusting grazing and farming structures.

[9] Jonathan M. Davies (World Initiative for Sustainable Pastoralism, IUCN) "Global changes in pastoral policy", in *Proceedings of the Joint International Conference*: *Desertification and the International Policy Imperative*, 17-19 December 2006, Algiers, Caroline King, Harriet Bigas and Zafar Adeel, eds. (Hamilton, Ontario, Canada, International Network on Water, Environment and Health (UNU-INWEH), 2007), pp. 65 and 68-70.

Guarantee policies include land tenure, forest property rights, and agricultural services policies.

Source: Jia Xiaoxia (National Bureau to Combat Desertification, State Forestry Administration, China), "The role of policies in combating desertification", in *Proceedings of the Joint International Conference*: *Desertification and the International Policy Initiative*, pp. 134 and 141-142.

8. Policies to combat desertification may directly entail new land management options for drylands (see box II), such as the introduction of new types of trees in agroforestry, new ways of harvesting and managing water, and combining organic and inorganic sources of soil fertility. They may also promote collective management practices of land resources, at a watershed or ecosystem level, which may result in new ways of exchanging goods and services between stakeholders, having consequences in turn for other policy domains. Scientific knowledge of the potential environmental services provided by drylands, such as wind erosion protection, conservation of biodiversity and soil carbon sequestration, has to be improved, in order to quantify the potential benefits and identify who should pay for those benefits.

9. Alternative livelihoods that do not depend on traditional land uses are less demanding in respect of local land and natural resource use and can provide, in some cases, sustainable income. Such livelihoods include dryland aquaculture for production of fish, crustaceans and industrial compounds produced by microalgae, and greenhouse agriculture, as well as tourism-related activities. They generate relatively high income per land and water unit in some places. Dryland aquaculture under plastic cover, for example, minimizes evaporative losses, and provides the opportunity to use saline or brackish water productively. The Sustainable Management of Marginal Drylands (SUMAMAD) project in Jordan, which promoted ecotourism, and the project in Pakistan, which established saline fish ponds to diversify income opportunities, offer good examples of pilot-scale alternative livelihoods in drylands.[10]

10. The *Desertification Synthesis* of the *Millennium Ecosystem Assessment, 2005* suggested that alternative livelihoods could provide their practitioners with a competitive edge on those outside the drylands, since they harness dryland features such as solar radiation, winter relative warmth and brackish geothermal water. The implementation of such practices in drylands requires institution-building, access to markets, technology transfer, capital investment, and reorientation of farmers and pastoralists. Desertification could also be avoided through changes in the economic and institutional settings which would create new economic opportunities for people in drylands urban centres and areas outside drylands and thereby help relieve current pressures underlying desertification processes.[11]

[10] Cathy Lee and Thomas Schaaf, eds., "Sustainable management of marginal drylands: using science to promote sustainable development: project findings from Northern Africa to Asia" (Paris, UNESCO, 2008), pp. 126 and 150.

[11] Millennium Ecosystem Assessment, *Ecosystems and Human Well-Being: Desertification Synthesis*, p. 15.

11. Evidence suggests that land-use policies tailored to local conditions and implemented in cooperation with local governance, such as farmers' field schools and farmers' associations, provide the greatest benefit to affected communities. Provision to farmers of information and training on suitable land management options and their impacts on productivity and farmers' costs and risks are essential (see Report of the Secretary-General on land (E/CN.17/2009/5)).

12. Building on the traditional knowledge that local communities and indigenous peoples have developed in their interaction with nature over time has proved to be an effective way of promoting self-help in addressing desertification, for example, through rainwater harvesting, including through the use of underground reservoirs or cisterns in arid areas, and biodiversity conservation. Promoting this kind of knowledge should also ensure that local communities and indigenous peoples can benefit directly from its commercial use.

13. Community participation in formulation of policies relevant to sustainable land management and livelihoods in desertification-affected areas remains vital for their practicability and successful implementation. Recognizing the experience and expertise of local communities in respect of policy formulation and implementation enhances the benefits that can be achieved. The newly launched Green Wall[12] for the Sahara Initiative, for example, explicitly employs a multidisciplinary approach, involving multiple actors at different levels, including the State, local communities and private entrepreneurs.[13]

14. Payment for ecosystem services can be a useful incentive with respect to encouraging the sustainable use and management of agricultural and pastoral lands. Rural income incentives, including planting trees, demarcation of pastoral corridors, and rotational pasturing systems, need to be encouraged. Such encouragement may require reorientation of existing institutions and investment in developing more appropriate institutional frameworks for mainstreaming these policies within economic development frameworks.[14]

B. Enhancing soil productivity and water-use efficiency

15. Mounting evidence suggests that existing water shortages in drylands are projected to increase over time owing to population increase, land cover change, and global climate change. Research is showing that climate changes have already been occurring in parts of Africa, in the form of seasonal changes and changes in the timing and duration of rain events. The Tyndall Centre for Climate Change Research "Adaptive" Project in Southern Africa reported that societies and households did recognize subtle climate changes and did respond effectively to the environmental changes that they produced, as long as socio-economic frameworks permitted this. In this connection, policies and national action programmes on desertification need

[12] African Union, Department of Rural Economy and Agriculture Project, 2005. This initiative, which involves 20 countries threatened with desertification, seeks to slow the southwards advance of the Sahara desert and improve the livelihoods of the inhabitants of the Sahara and Sahelian zones.

[13] "Desertification and International Policy Bulletin", vol. 6, No. 1 (22 December 2006).

[14] *Re-thinking Policies to Cope with Desertification,* pp. 3 and 10.

to consider options that would assist populations to cope with and adapt to climate changes and variability.[15]

16. Given the high vulnerability of the region to climate change, the Economic Commission for Africa (ECA) recommended strengthening monitoring and management of and adaptation to drought and desertification. Actions include strengthening capacity for systematic climate observations by specialized centres; conducting timely climate information outreach and application; establishing early warning systems and drought risk management institutions; creating knowledge networking platforms and tools such as subregional and regional forums; and employing traditional and modern information and communications technologies.[16]

17. Evidence from a growing body of case studies demonstrates that the adoption of sustainable agricultural technologies and practices has increased soil productivity in desertification-affected drylands. Land users in the Sahel region, for example, are achieving higher productivity by capitalizing on improved organization of labour, more extensive soil and water conservation, increased use of mineral fertilizer and manure, and new market opportunities corresponding to the comparative advantage of drylands, encompassing, for example, livestock and livestock products, handicrafts and ecotourism services, and high-value plants and tree products.

18. Incentives to farmers that have yielded tangible returns have proved to be essential in motivating them to invest in soil conservation and the introduction of new and sustainable agricultural and farming methods. Such incentives included improved access to appropriate and affordable agricultural technologies such as drought-resistant crop varieties, affordable credit and markets for their products, the development of economic and social infrastructure such as roads, and energy and water supply infrastructure, and access to extension services and field training.

19. Research at the International Center for Agricultural Research in the Dry Areas (ICARDA) has led to the development and promotion of technologies that can improve crop/livestock integration in the drier areas by enhancing and stabilizing the production and quality of animal feed and by controlling soil erosion and thus reducing pressure on common rangelands. Alley-cropping systems (tree crops interspersed with patches of food crops), using fodder shrubs along with other annual forage alternatives, constitute one type of cropping system that can increase feed availability, particularly under low rainfall and marginal land conditions. This cropping system was introduced in the marginal lands of Morocco and Tunisia through the Mashreq/Maghreb adaptive research project, which combined research on natural resources management with research on integrated crop-livestock production.[17]

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[15] David S. G. Thomas (Oxford University Centre for the Environment and Tyndall Centre for Climate Change Research), “The challenge of global warming: impacts on desertification in 21st century Africa” in *Proceedings of the Joint International Conference*: *Desertification and the International Policy Imperative*, p. 293.

[16] Economic Commission for Africa, “Africa review report on drought and desertification” (main report) (ECA/FSSD/ACSD/5/3), November 2007, pp. 51-52.

[17] International Centre for Agricultural Research in the Dry Areas (ICARDA), “Case study: NRM technologies in crop-livestock production systems in arid and semi-arid areas of Morocco and Tunisia”, Natural Resources Management Research Impacts: Evidence from the Consultative Group on International Agricultural Research (CGIAR) (CGIAR Science Council Secretariat-Standing Panel on Impact Assessment, October 2006).

Box III
Improving efficiency in irrigated agriculture in Kenya

The Wei Wei Integrated Development Project implemented in the Kerio Valley of Kenya set out to address the problem posed by the declining local economy, which is based on livestock and small-scale agriculture. Population growth had led to severe decreases in plot sizes, soil fertility and agricultural incomes. The expansion of irrigated areas was limited by the low levels of technology available to farmers.

The project constructed an intake weir on the Wei Wei River, laid an underground pipeline network to distribute water through gravity-fed sprinkler irrigation units, and set up a pilot farm to provide logistic support, equipment and other inputs to project farmers.

As a result, 700 hectares of land were reclaimed and improved, and 540 individual plots of 1 hectare each were allocated and developed as small farms. The project showed strong potential for long-term sustainability. The irrigation technology used did not require external inputs, and maintenance costs were minimal.

Source: "Water for community development: building on traditional knowledge: the Wei Wei Integrated Development Project, Kerio Valley, Sigor, Kenya", in *Success Stories in the Struggle Against Desertification*, (Nairobi, United Nations Environment Programme, 2002), pp. 19-20 and 115-116.

20. Inefficient water use in irrigated agriculture and unsustainable exploitation of groundwater aquifers have further depleted the freshwater bodies and groundwater resources in many drylands. In Yemen, insufficient regulatory frameworks combined with inefficient irrigation practices have contributed to serious groundwater depletion and an alarming degradation in water quality in the Sana'a Basin.[18]

21. Water policies including allocation systems, pricing, government investments in water resource development and priorities in conservation measures are essential for successful natural resources management (see box III). Water allocation for irrigation has caused degradation in some dryland areas where flows in semi-arid rivers used for irrigation, such as the River Ord in Western Australia, are highly variable and unpredictable. Therefore, the proportionate water release strategies that are based on average monthly flows have been found to be unsuitable for, and to cause detrimental effects to, the riverine ecosystem in drylands. To this end, water policies focusing on the availability of sustainable water sources and the amount of water that can be withdrawn and used by different users, with more attention to demand management, can be more useful in drylands. Irrigation policy decisions depend on factors such as water availability, water pricing and anticipated crop prices, among others. Institutional reforms such as pricing of water have been slow to materialize owing in part to resistance by strong political interest groups to policy changes in the water sector. The National Water Act of South Africa is an example of innovative legislation that is attempting to address these issues. It calls for

[18] Water and Environment Centre, Sana'a University, Sana'a, Yemen (http://www.wec.edu.ye/research.htm).

meeting the basic water needs of all people and all ecosystems first and adopts pricing structures that penalize excessive water use, especially during dry periods.[19]

Box IV
Community-level rainwater harvesting in eastern Rajasthan, India

The project addressed protecting and regenerating forests to stop soil erosion in the dry Alwar district, harvesting rainwater by small check dams to store monsoon rainwater, irrigating fields, recharging dry wells and extending the consensus within the community to take up the initiative. Community participation at the village level and the increased participation of women in village decisions made the programme a great success. The project resulted in close to 3,000 water harvesting structures in 650 villages, regeneration of land and an increase in the availability of water which allowed agriculture to be productive and self-sustaining.

Source: *Civic Entrepreneurship: A Civil Society Perspective on Sustainable Development*, vol. 4, *South Asia Report*, Tariq Banuri, Adil Najam and Nancy Odeh; eds. (Islamabad, Stockholm Environment Institute, United Nations Environment Programme and the RING Alliance of poverty research organizations, 2002), pp. 244-245.

22. Provision of non-conventional water sources through, for example, desalination of sea water and reclamation of waste water can be an effective way of coping with the chronic water scarcity in dry areas. Egypt, for example, introduced solar-powered desalination units in the western and eastern deserts to generate safe drinking water.

23. Maintaining and rehabilitating the natural vegetation are essential in protecting soils from wind and water erosion and preventing the loss of ecosystem services during periods of drought (see box IV). Local reforestation projects facilitated the natural process of ecological restoration in China; for example, in Inner Mongolia, the tree planting on degraded grasslands suffering from limited availability of water and extreme temperatures helped in effecting the natural regeneration of those grasslands. The Forest Action Plan adopted by the European Union (EU) provides the framework within which member States may develop national afforestation guidelines, promote agroforestry systems and encourage investments that can enhance the ecological value of forests and support forest fire prevention and restoration measures.[20]

24. The experience of the Food and Agriculture Organization of the United Nations (FAO), gained with implementation of forest projects in desertification-affected countries in Africa, suggests that the successful implementation of forestation projects depends on factors such as the use of different vegetation cover

[19] Millennium Ecosystem Assessment, *Ecosystems and Human Well-Being: Current State and Trends: Findings of the Conditions and Trends Working Group*, vol. I (Washington, D.C., Island Press, 14 December 2005), chap. 22, “Dryland systems”, pp. 659-660.

[20] See national information by country or organization provided to the Commission on Sustainable Development at its sixteenth and seventeenth sessions (European Commission, “Desertification: internal EU Desertification-related policies”, 2008, p. 31).

types, with crop and tree species selected by the local communities that will benefit from the project, consideration of locally adapted species, the protection of restored land and vegetative cover from the causes of their degradation, and the involvement of local people in project implementation.

25. The conventional means of technology transfer, by which scientists develop technologies in research facilities and extension workers pass them on to farmers, have often yielded disappointing results. In many cases, application of these technologies were too costly or did not suit farming conditions. Harnessing the potential of traditional and indigenous knowledge has been effective in soil conservation and water-use efficiency at community and household levels.

C. Promoting tenure security

26. A large body of evidence attests to the importance of policies that provide land users with security of tenure and access rights to natural resources. Linking policies devised to improve tenure security, such as long-term leasehold contracts or titling of freehold land, to farmers' investment or conservation activities has proved to be an incentive to sustainable land management (see report of the Secretary-General on land (E/CN.17/2009/5)).

27. Customary tenure systems, which are very common in dry rangelands, have provided substantial security of access rights, while titling programmes may undermine the security of traditional systems by introducing opportunities for rent-seeking, or not addressing land-related conflicts or settlement procedures. Many African countries, for example, Ghana, Lesotho, Malawi, Zambia and South Africa, have policies and laws that recognize customary land tenure and land rights, thereby providing landowners with the confidence to invest in the protection and development of their lands in such a way as to help combat land degradation and desertification as well as address conflicts over land.[21]

28. Community-based tenure systems have operated quite effectively in cases where greater transparency and fairness in the allocation of resources to all participants have been ensured. Private land tenure systems in drylands have been less successful in ensuring that pastoralists have access to various ecosystem services such as provisioning of water and pasture.

III. Means of implementation

A. Strengthening the institutional framework for policy implementation

29. Governments increasingly recognize the importance of addressing land degradation, desertification and poverty in tandem (see box V). National action programmes on desertification are being integrated with broader development frameworks such as national development programmes and poverty reduction

[21] Rosebud Kurwijila (Rural Economy and Agriculture, Commission of the African Union), "Policies towards combating desertification in Africa", in *Proceedings of the Joint International Conference: Desertification and the International Policy Imperative*, pp. 195-200.

strategies. In a number of countries in Africa, Asia, Latin America and the Caribbean, regulatory policies have been adopted to support the implementation of national action programmes on desertification. Incorporating the priorities on desertification identified by national action programmes into the national budget, decentralization of actions to the local level, empowerment of local stakeholders, in particular women, partnerships and regional cooperation are all means used by countries in the implementation process.

Box V
Iceland's comprehensive institutional framework

Iceland adopted a comprehensive policy and legal framework to halt soil erosion in pastures and rangelands. It is based on clear long-term goals and a broad range of measures including harmonization of all laws that affect land and land use, tailoring agricultural policy to conservation concerns, integrating a wide range of supporting factors such as planning, research, extension and education, and providing incentives that stimulate knowledge, awareness and conservation ethics. A parliament-approved soil conservation programme provided the operational framework.

Source: Andres Arnalds (Soil Conservation Service of Iceland) "Policy lessons from a century of soil conservation in Iceland", in *Proceedings of the Joint International Conference: Desertification and the International Policy Imperative*, pp. 100-105.

30. National programmes are complemented by subregional and regional programmes, particularly when transboundary resources are involved. A good example involves the Jordan River Basin. The Basin, which covers an area that includes parts of Lebanon, the Syrian Arab Republic, Jordan, Israel and the Palestinian territories, has witnessed a succession of attempts to develop effective transboundary management, underlining the importance of the River's waters in the dry region of the Middle East and indicating the political significance of the role played by the River for its co-riparian States.[22]

31. In Africa, regional and subregional initiatives such as the Comprehensive Africa Agriculture Development Programme and the newly launched Green Wall for the Sahara Initiative give significant recognition to land degradation and desertification as key factors affecting development. Institutional arrangements at the subregional level have been established to support the implementation of policies and programmes on desertification. A number of subregional initiatives promote joint activities, exchange of information and collaboration in respect of human resources and institutional capacity-building. However, incorporating and integrating regional and subregional policies into national programmes need more attention.

[22] Ministry for Foreign Affairs, Sweden, *Transboundary Water Management as an International Public Good*, River Basins Case Studies, No. 2001:1 (Stockholm, 2001).

32. Thematic programme networks created the basis for regional initiatives in the Asian region. Each of the six thematic programme networks[23] deals with one particular aspect of desertification and aims at providing and promoting regional solutions through improved and innovative regional cooperation and exchange of information. There is evidence that the implementation of the national action programmes in many Asian countries has been advanced by the promotion of regional cooperation and capacity-building at national and subregional levels through the six thematic programme networks.

33. West Asia has undertaken efforts to harmonize policies and actions on desertification at the regional level. For example, in 2002, the Arab Center for the Studies of Arid Zones and Dry Lands (ACSAD)[24] and the International Center for Agricultural Research in the Dry Areas (ICARDA) started the implementation of four-year pilot projects on integrated natural resource management for combating desertification in the Syrian Arab Republic, Jordan, Yemen and Lebanon. However, subregional action programmes for Western Asia still lack comprehensive approaches to combating desertification.

34. Several subregional action programmes on desertification have been launched and are being implemented in Latin America and the Caribbean. For example, the subregional action programme of Gran Chaco Americano (Argentina, Bolivia and Paraguay) is implementing sound actions on socio-economic and environmental degradation. Key factors of success identified in a recent regional analysis of successful policies to combat desertification include stakeholder participation, institutional development, promoting education and research, decentralization of action, impact assessments, public investments in the implementation of local initiatives, and the provision of incentives for land restoration and conservation.[25]

35. At the global level, the United Nations Convention to Combat Desertification constitutes the only legally binding universal agreement that systematically addresses land degradation and desertification, creating an internationally agreed framework for national actions and regional and international cooperation on desertification. The Convention is being implemented through national, subregional and regional action programmes.

36. The 10-year strategic plan and framework to enhance the implementation of the Convention (2008-2018) (A/C.2/62/7, annex) opened the way to renewed commitment among stakeholders. The commitment will enhance the implementation of the Convention and the related decisions adopted at the eighth Session of the Conference of the Parties to the Convention, which encompass important guidance with regard to implementation of the Convention.

37. Over the past few years, there has been increased awareness of the usefulness of enhancing collaboration among the secretariats of the United Nations Convention

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[23] The six thematic programme networks are: TPN1: Desertification monitoring and assessment; TPN2: Agroforestry and soil conservation; TPN3: Rangeland management and fixation of shifting sand dunes; TPN4: Water resources management for arid-land agriculture; TPN5: Strengthening capacities for drought impact mitigation and combating desertification; and TPN6: Assistance for the implementation of integrated local-area development programmes.

[24] ACSAD (www.acsad.org/TechnicalCooperation.asp).

[25] United Nations Convention to Combat Desertification, “Combating desertification in Latin America and the Caribbean”, fact sheet No. 13 (http://www.unccd.int/publicinfo/factsheets/pdf/Fact_Sheets/Fact_sheet_13eng.pdf).

to Combat Desertification, the United Nations Framework Convention on Climate Change[26] and the Convention on Biological Diversity,[27] within the contexts of their specific mandates. The latest Africa review report on drought and desertification, for example, calls for linking measures to combat drought and desertification with measures aimed at addressing climate change and biodiversity conservation, which would help diversify resources available for implementation of national action programmes on desertification and scale up sustainable land management programmes.[28] Enhanced collaboration among the secretariats of the three Conventions needs to be complemented by improved coordination policies and measures on desertification at the national level, given that the responsibility and authority for the implementation of the three Conventions often fall on different ministries and governmental institutions.

B. Investing in natural resources management

38. Combating desertification requires large and long-term investments that are difficult to mobilize from central and local government budgets alone (see box VI). It also requires providing economic and non-economic incentives to stakeholders, including small-scale land users, to invest in the sustainable management of land, forests and other natural resources. Such incentives may include more secure tenure, greater access to land, water and forests resources, improved access to credit and technology on favourable terms, more robust early warning and information systems, and capacity-building. International development cooperation can play a critical role in mobilizing financial resources, including official development assistance (ODA) for combating desertification and land degradation.

39. In particular for Africa, bilateral development assistance both in grants and on concessional terms has remained the largest external source of financing in the fight against desertification. Multilateral bank loans made on a commercial basis are the major external source of funds for Latin America and Asia. Foreign private investment is also important in both regions, although it has been largely untapped in Africa. The World Bank, the International Fund for Agricultural Development (IFAD) and other multilateral, international and regional development financial institutions as well as United Nations bodies should continue to play a prominent role in financing anti-desertification efforts.

Box VI
Investing in natural resources management in Latin America and the Caribbean

Some Governments in the Latin American and Caribbean region have increased their share of national investment in natural resource conservation and management. Channelled through regional and municipal governments as part of development environmental projects, such investment has resulted in greater local autonomy of decision-

[26] United Nations, *Treaty Series*, vol. 1771, No. 30822.
[27] Ibid., vol. 1760, No. 30619.
[28] Economic Commission for Africa, “Africa review report on drought and desertification” (main report) (ECA/FSSD/ACSD-5/3), November 2007, p. 51.

making, increasing negotiation capacity with co-funders and greater appropriation of projects.

Additionally, at the national and local levels, some Governments have been able to multiply their investments by attracting funds from the private sector and the international community through co-financing schemes. The freeing of national resources through debt relief and the valuing of environmental services have increased the availability of resources and, in many cases, allowed the execution of specific projects with the participation of targeted groups, such as indigenous communities and small producers.

Source: Denis L. Avilés Irahola (Latin American Unit of the UNCCD), "Policies to combat desertification: a perspective on the Latin American and the Caribbean region", in *Proceedings of the Joint International Conference: Desertification and the International Policy Imperative*, pp. 189-190.

40. The adoption of land degradation as a Global Environment Facility (GEF) Focal Area and the subsequent establishment of the Operational Programme on Sustainable Land Management (OP15) enabled the Facility to become a major source of funding of sustainable land management programmes and projects, carried out in collaboration with the United Nations Convention to Combat Desertification. These initiatives are beginning to make a difference and need to be continued and expanded. The demand for Facility support is high and given the limited resources available and owing to considerations related to cost-effectiveness, the strategy for supporting catalytic and innovative activities entails focusing on prevention of land degradation and not including rehabilitation of degraded lands.[29]

41. Most of the time, efforts to attract private sector investments in sectors relevant to desertification and drought were not successful owing to lack of financial incentives that could help to secure profitable investment returns. Poverty and inadequate access to affordable credit facilities made it difficult for local people to secure funding that they could profitably invest in measures to prevent land degradation and sustain their livelihoods.

42. Recognizing the interdependence between environmental development and economic development, a number of multilateral and regional development financial institutions have included land degradation and desertification in their lending policy. For instance, the African Development Bank through its lending policy commits to routinely integrating environmental considerations into country assessment and project design, including reversing land degradation and desertification, in order to help improve quality of life of the people and enhance the ecological and life support systems across the continent.[30]

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[29] Jos Lubbers (GEF secretariat), "Policy feedback from GEF-IYDD events", in *Proceedings of the Joint International Conference: Desertification and the International Policy Imperative*, pp. 46-50.

[30] African Development Bank, "African Development Bank Group's policy on the environment", sect. 5.3 ("Key environmental issues"), February 2004.

C. Promoting technology transfer

43. Satellite-based remote sensing technology can be used to assess, analyse and quantify the nature, extent, severity and impacts of land degradation and desertification. Drylands lend themselves to remote sensing because they are mostly cloud-free and allow for a wide range of images. Continuity of observations is required to account for the high inter-annual variability of dryland ecosystem services. Access to affordable satellite imagery, particularly in developing countries, is critical for effectively undertaking such integrated uses.[31]

44. As part of their national action programmes, some African countries have established information systems to assist in monitoring interventions on desertification and drought (see box VII). In the Sahel region, 11 countries have established observatories as part of the launching of a long-term ecological monitoring and observatory network. The network will gather information on the evolution of ecosystems and the effectiveness of ecosystem management in the region.[32] For example, between 1982 and 2003, satellite images showed a considerable regrowth of vegetation over large portions of the Sahel region.[33] Such observations underscore the importance of monitoring and observation systems as an effective tool for establishing inventories of desertification-affected areas, understanding desertification processes, and evaluating the effectiveness of policies and measures designed to combat land degradation and desertification (see report of the Secretary-General on drought (E/CN.17/2009/6)).

Box VII
Establishing desertification information systems: the case of Tunisia

Tunisia's desertification information system aims at assessing the impact of investments on preventing desertification. It enables the compilation of management charts for national policymakers at different levels. In addition, a desertification information pooling system has been set up to provide crucial information for national planning. The desertification information pooling system consists of the desertification issue chart at national level, which shows the quantities and qualities of the various natural resources, the causes of desertification in each region and monitoring indicators pertaining to the resources. Regular desertification observations are logged in the national action programme indicator grid, which is the tool used to monitor desertification and evaluate the impact of the national action programme.

Source: United Nations Convention to Combat Desertification, "Drought and desertification monitoring and assessment: Tunisia", in *Implementing the United Nations Convention to Combat Desertification in Africa: Ten African Experiences* (Bonn, UNCCD secretariat, 2006), p. 37.

[31] Millennium Ecosystem Assessment, *Ecosystems and Human Well-Being: Desertification Synthesis*, p. 19.

[32] E/CN.17/2008/7, para. 65.

[33] *Trends in Sustainable Development: Africa Report 2008-2009* (United Nations publication, Sales No. E.08.II.A.1).

45. The FAO Land Degradation Assessment in Drylands (LADA) project systematically observes land degradation in order to increase understanding of the process and the impacts of drought and desertification. A new quantitative global assessment under the Assessment identifies black spots of land degradation by trends analysis of the last 25 years' net primary productivity (NPP) or biomass production. Net primary productivity is derived from satellite measurements of the normalized difference vegetation index (NDVI) or greenness index. The Land Degradation Assessment in Drylands and similar assessment tools can assist in establishing a baseline against which the extent and quality of restoration in drylands may be measured.[34]

46. The United Nations Convention to Combat Desertification Committee on Science and Technology serves as a liaison between the Conference of the Parties to the Convention and the scientific community. The Committee on Science and Technology facilitates cooperation and information-sharing among national, international and non-governmental entities. Strengthening the Convention's Committee on Science and Technology can further international cooperation as well as help optimize scientific research and output in the area of desertification.

D. Capacity-building

47. Capacity-building, education and training are essential for the empowerment of local authorities and communities, particularly youth and women, and the building of partnerships in decision-making and implementation of policies and measures to combat desertification. The best practices and lessons learned that emerge from approaches undertaken at various levels to combat desertification need to be compiled, shared, replicated and scaled up.

48. Experience suggests that education and training programmes on sustainable land use and natural resources management designed for local communities can be useful tools in mobilizing and empowering local authorities, local communities and individual land users, in particular women. Sustainable land management capacity-building can be made more effective by paying particular attention to the training of administrators, practitioners and local partners in different aspects of sustainable land-use planning and management.

49. The FAO Farmers Field School approach for integrated soil management, which follows the principles of people-centred learning and is based on experience in Africa, has been developed as an alternative to the conventional top-down test and verification extension approach. It uses innovative and participatory methods to create a learning environment in which land users have the opportunity to learn from each others' experiences in areas such as crop production, soil and water conservation, water harvesting and irrigation. The FAO Land Degradation Assessment in Drylands project is giving substantial attention to training, institutional and technical capacity-building with the final goal of improving policy and decision-making capability. The project is emphasizing multi-stakeholder

[34] United Nations Environment Programme, *Global Environmental Outlook: Environment for Development (GEO 4)* (Valletta, Progress Press, Ltd, for UNEP, 2007), p. 124.

involvement and participation, especially of land users and farmers at the local level and of policymakers at national and global levels.[35]

50. The Africa review report on drought and desertification has highlighted the assistance from the United Nations Development Programme (UNDP) Integrated Drylands Development Programme (IDDP), with a focus on capacity-building, in helping many African countries to mainstream and integrate national action programmes into national policy and planning frameworks; reducing vulnerability of poor populations to climatic shocks, especially drought; and improving local governance of natural resources management.[36]

IV. The way forward

51. The analysis presented above has indicated several critical areas requiring urgent attention in combating desertification. The present section highlights those areas together with the range of policies and actions that may contribute to meeting this objective.

52. There exists significant knowledge on measures to combat desertification, which should be circulated widely to promote broad assimilation of these strategies. Towards this end, strong coordination among scientific research institutions, policymakers, extension workers and practitioners is needed.

53. The link between climate change and land degradation needs to be taken into account in implementing regional and national policies to combat desertification. Particular attention should be given to regions, such as Africa and West Asia, that are facing more serious challenges. Such policy frameworks should integrate actions that will enhance the ability of rural populations to adapt to both climate change and climate variability.

54. Preparation of a national action plan to combat desertification in line with national development priorities is an important step towards addressing the challenges posed by desertification. Integrating these plans into national development frameworks such as poverty reduction strategies will ensure that their implementation would not be affected owing to lack of availability of funding and other resources. Successful implementation of these plans requires strengthening technical and institutional capacities at various levels, encompassing actors ranging from those involved in high-level policy formulation to those at the grass-roots level. In cases where the public sector has limited capacities, the civil society and other similar organizations should be encouraged to bridge the gap.

55. National policies and plans to combat desertification are often subject to externality effects: actions taken in one country can yield positive impact in the neighbouring country. To fully exploit such positive externalities, especially when transboundary resources are involved, opportunities for improved regional cooperation in the form of sharing of information, knowledge and best practices should be tapped so as to speed up the learning processes and bridge the technological, human resources and economic gaps. In respect of this endeavour, the

[35] http://www.fao.org/nr/lada.

[36] Economic Commission for Africa, “Africa review report on drought and desertification” (main report) (ECA/FSSD/ACSD-5/3), November 2007, pp. 41-43.

possibility of preparing and implementing joint action plans should be seriously examined.

56. Water management plays an important role in combating desertification. Therefore, water management policies need to encourage the use of water saving technologies, for example, through introducing demand management measures for water conservation in different uses, and promoting the cultivation of water-resistant crops. Options to cope with the chronic water scarcity in dry areas may include using non-conventional water resources, for example, through water recycling, reclamation and desalination, among other approaches.

57. Providing land tenure security and access rights to natural resources offers important incentives to land users to invest in soil and water conservation in agriculture. Combining implementation of land administration policies with land planning and management policies will yield quick benefits in terms of promoting sustainable land-use practices and addressing the factors causing land degradation. All of these policies need, however, to be tailored to local conditions, with a focus on decentralized implementation involving the active participation of stakeholders.

58. Scientific knowledge of the environmental services provided by drylands needs to be improved and the potential of payment for environmental services for sustainable land use in drylands, which has worked in some countries, needs further exploring. Outreach and advocacy efforts may be directed at promoting rural income incentives in the form of planting trees, demarcation of pastoral corridors, and introduction of rotational pasturing systems designed to rehabilitate degraded lands.

59. Sustainable grazing strategies and other sustainable practices in livestock production can have a significant impact on rehabilitating the degraded grasslands. Measures may include providing pastoralists with access to various ecosystem services, such as provisioning of water and pasture, adjustments in private land tenure systems to allow for pastoralists' mobility and increased integration of pastoral and agricultural land uses.

60. Community-based natural resources management has yielded good results in many parts of the world. To further the protection of land resources through this approach, community-based organizations such as farmers' associations and water management committees should be encouraged to play more active and effective roles in addressing land degradation, especially through the employment of traditional knowledge.