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BIODIVERSITY OF DRY AND SUB-HUMID LANDS: FOLLOW-UP TO REQUESTS OF THE CONFERENCE OF THE PARTIES IN DECISION IX/17

Note by the Executive Secretary

EXECUTIVE SUMMARY

In decision IX/17, the Conference of the Parties (COP) to the Convention on Biological Diversity (CBD) issued a number of requests to the Executive Secretary for consideration by the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) prior to the tenth meeting of the Conference of the Parties, including: (i) to compile information on the impacts of drought on biodiversity and prepare proposals on management options for biodiversity and drought, including early warning systems; (ii) to further develop the activities contained in paragraphs 29 and 30 of the progress report and consideration of proposals for future action (UNEP/CBD/COP/9/19), particularly activities related to economic valuation and payments for ecosystem services; and (iii) to explore the means to strengthen collaboration in pastoralism and agricultural use of dry and sub-humid lands.

Accordingly, the present note was prepared proposing drought management activities including: (i) modelling and early warning systems, (ii) enhanced implementation of integrated land and water management, (iii) conservation and management of natural resources, (iv) integration of traditional knowledge, (v) innovations and practices,(vi) improved use of agricultural biodiversity and (vii) applying the precautionary approach. The document also highlights successful activities by the Secretariat, Parties and other relevant organizations in support of implementation of the programme of work, and emphasizes gaps, particularly with regards to economic valuation, payments for ecosystem services and the development of incentive measures. Finally the document examines the need to further engage pastoral communities in implementation of the programme of work through actions at both the national and international levels.

* UNEP/CBD/SBSTTA/14/1.

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SUGGESTED RECOMMENDATIONS

The Subsidiary Body on Scientific, Technical, and Technological Advice *recommends* that the Conference of the Parties adopts a decision along the following lines:

The Conference of the Parties:

1. *Requests* the Executive Secretary, in collaboration with the Secretariat of the United Nations Convention to Combat Desertification, to:

(a) Develop and implement joint actions to increase cooperation between the natural and social science communities working in disaster reduction; and

(b) Publish a special CBD Technical Series report on the value of dry and sub-humid lands similar to the Technical Series reports on valuing wetlands and forests;

2. *Further requests* the Executive Secretary to expand:

(a) The online database of good practices and lessons learned with regards to linking biodiversity conservation and sustainable use to livelihoods in dry and sub-humid lands; and

(b) The incentive-measures database to better include programmes in dry and sub-humid lands.

3. *Further requests* the Executive Secretary to identify:

(a) In collaboration with the Food and Agriculture Organization of the United Nations (FAO), best practices to address conflict between biodiversity conservation and sustainable use and pastoralism and agriculture in dry and sub-humid lands in order to fill identified gaps in information.

(b) Good practice examples of the engagement of marginalized groups in the implementation of the programme of work on the biodiversity of dry and sub-humid lands.

4. *Further requests* the Executive Secretary to convene a meeting of the Joint Liaison Group of the three Rio conventions on elements on a joint work programme on climate change, biodiversity and land degradation for the consideration by the Parties of the respective conventions;

5. *Further invites* Parties and other Governments to:

(a) Develop and implement drought management plans at all levels to reduce the impacts of drought on biodiversity, including through the involvement of all stakeholders including women and, where relevant, in accordance with traditional community-based strategies;

(b) Integrate issues related to drylands contained in the strategic plan of the Convention on Biological Diversity and the United Nations Convention to Combat Desertification (UNCCD) into revised national biodiversity strategies and action plans and national action programmes to combat desertification with a view of improving harmonization where needed;

(c) Continue to implement those activities contained in paragraphs 29 and 30 of the progress report and consideration of proposals for future action prepared by the Executive Secretary for the ninth meeting of the Conference of the Parties (UNEP/CBD/COP/9/19), including through regional programmes, recognizing that implementation has, thus far, been limited.

6. *Further invites* Parties and other Governments to establish specific targets in line with the Strategic Plan for 2011 to 2020 to assess implementation of the Convention on Biological Diversity in dry and sub-humid lands in order to better reflect the particular challenges faced by such ecosystems and the people living in them including, *inter alia*, vulnerability to climate change and the urgent need for economic development;

7. *Further invites* Parties and other Governments and relevant organizations to support activities identified in national capacity self-assessments that promote synergies between the Convention

on Biological Diversity and the United Nations Convention to Combat Desertification at the subnational, national and regional level.

I. INTRODUCTION

1. In paragraph 14 of decision IX/17 on the biodiversity of dry and sub-humid lands, the Conference of the Parties requested the Executive Secretary to compile information on the impacts of drought on biodiversity and prepare proposals on management options for biodiversity and drought, including early warning systems, for consideration by SBSTTA prior to the tenth meeting of the Conference of the Parties. Furthermore, in paragraph 16 of the same decision, the Conference of the Parties, recognizing the high rate of poverty within dry and sub-humid lands, requested the Executive Secretary to further develop the activities contained in paragraphs 29 and 30 of the Progress Report and Consideration of Proposals for Future Action (UNEP/CBD/COP/9/19), particularly activities related to economic valuation and payments for ecosystem services for consideration by SBSTTA prior to the tenth meeting of the Conference of the Parties.

2. Finally, in paragraph 9 of decision IX/17 on the biodiversity of dry and sub-humid lands, the Conference of the Parties requested the Executive Secretary to explore, with FAO, and UNCCD, the means to strengthen collaboration in pastoralism and agricultural use of dry and sub-humid lands in line with paragraph 11 (c) of decision VIII/2 and to produce a report on the actions that have already been undertaken and actions that need to be carried out, taking into account the specific features of dry and sub-humid lands and the needs of the people living in these lands, for further consideration by SBSTTA prior to the tenth meeting of the Conference of the Parties.

3. As such, the Executive Secretary prepared the following proposals based on a review of literature, best-practice examples drawn from a review of relevant projects and programmes at the local, national and regional levels, and an analysis of fourth national reports to the Convention on Biological Diversity. In addition to the International Strategy for Disaster Reduction, the Executive Secretary collaborated with the Secretariat of the United Nations Convention to Combat Desertification and the United Nations Development Programme in the preparation of this document. Section II contains proposals on management options for biodiversity and drought within dry and sub-humid lands while section III contains proposals on further action and section IV contains a report on collaboration in pastoralism and agricultural use of dry and sub-humid lands including proposals for further action.

4. In addition to the present document, an information note is under preparation on pastoralism, biodiversity and carbon sequestration as an initial input on identifying and valuing ecosystem services.

II. PROPOSALS ON MANAGEMENT OPTIONS FOR BIODIVERSITY AND DROUGHT WITHIN DRY AND SUB-HUMID LANDS

A. Impacts of drought on biodiversity

5. The United Nations Convention to Combat Desertification (UNCCD) defines drought as the naturally occurring phenomenon that exists when precipitation has been significantly below normal recorded levels, causing serious hydrological imbalances that adversely affect land resource production systems.[1] The term drought may refer to meteorological drought (precipitation well below average), hydrological drought (low river flows and water levels in rivers, lakes and groundwater), agricultural drought (low soil moisture), and environmental drought (a combination of the above).[2] Climate change is expected to further intensify drought.[3] Indeed, according to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), the proportion of the land surface suffering from

[1] UNCCD, Combating Desertification Glossary. http://www.unccd.int/knowledge/glossary.php

[2] IPCC, 2007: Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp.

[3] Millennium Ecosystem Assessment, 2005. Ecosystems and Human Well-being: Desertification Synthesis. World Resources Institute, Washington, DC.

extreme drought is predicted to increase by a factor of 10 to 30 by the 2090s globally. In addition, the number of extreme drought events per 100 years and mean drought duration are likely to increase by factors of two and six, respectively, by the 2090s.[4]

6. Drought, especially when associated with desertification, can have serious impacts on biodiversity. In a check list of drought impacts, the following specific effects have been identified:[5]

(a) Reduction and degradation of fish and wildlife habitat;

(b) Lack of feed and drinking water;

(c) Greater mortality due to increased contact with agricultural producers;

(d) Increased exposure to disease;

(e) Increased vulnerability to predation (from species concentrated near water);

(f) Migration and concentration (loss of wildlife in some areas and too much wildlife in other areas);

(g) Increased stress to endangered species;

(h) Loss of biodiversity.

7. Direct impacts of droughts on biodiversity include habitat degradation and loss, leading to a decrease in biological productivity. In North America's Prairie Pothole region for example, climate change models have projected an increase in drought with a 3°C regional temperature increase leading to large losses of wetlands and to declines in the populations of waterfowl breeding in these wetlands.[6]

8. Droughts can also lead to increased siltation through the drying of soil which increases susceptibility to wind erosion and the subsequent deposition of soil and silt in water bodies. Soil erosion can also contribute to moving the seed capital of the ground, uprooting grassy and woody species, sometimes smothering valuable species in accumulation areas.[7] The reduction in biological productivity caused by droughts can also lead to a lower vegetation cover that increases albedo, and to reduced water recycling, thus decreasing precipitation.[8] Finally droughts directly affect forest dynamics, causing tree mortality such as that which has already been observed in the Argentinean Andes, North American woodlands, and in the eastern Mediterranean. In addition, drought can increase the risk of forest fires.[9]

9. Droughts also indirectly affect biodiversity. For example, as biological and economic productivity deteriorates, communities can be forced to migrate to other areas or engage in other coping activities that too contribute to biodiversity degradation.[10] Furthermore, with 54 per cent of accessible runoff already appropriated for anthropogenic use,[11] declining water availability in desert margins and

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[4] IPCC, 2007: Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp.

[5] National Drought Mitigation Center. Checklist of Historical, Current and Potential Drought Impacts. http://www.drought.unl.edu/pubs/checklist.pdf

[6] IPCC, 2007: Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp.

[7] Economic Commission for Africa (UNECA), 2008. Africa Review Report on Drought and Desertification. Accessed at: http://www.uneca.org/eca_resources/Publications/books/drought/

[8] Millennium Ecosystem Assessment, 2005. Ecosystems and Human Well-being: Desertification Synthesis. World Resources Institute, Washington, DC.

[9] Nepstad, D., P. Lefebvre, U.L. Da Silva, J. Tomasella, P. Schlesinger, L. Solorzano, P.Moutinho, D. Ray and J.G. Benito, 2004:Amazon drought and its implications for forest flammability and tree growth: a basin-wide analysis. *Global Change Biol.*, **10**, 704-717.

[10] Economic Commission for Africa (UNECA), 2008. Africa Review Report on Drought and Desertification. Accessed at: http://www.uneca.org/eca_resources/Publications/books/drought/

[11] Threats to Rivers, Lakes and Wetlands. WWF, http://www.panda.org/about_our_earth/about_freshwater/freshwater_problems/

dryland areas will likely result in the increased exploitation of aquifers, inland waters and oases. This may result in degradation of such inland waters resources with negative consequences for both permanent and transient riparian species.

B. Management options for biodiversity and drought

10. Risks to biodiversity from drought can be reduced through combating desertification and the application of adaptation strategies and measures to improve preparedness. Adaptation generally involves drought management plans and coping strategies, while preparedness is mostly managed through the development of climate predictions and early warning systems. Drought management plans can include risk evaluation, impact assessments and impact management. Drought management should also address the vulnerability of the affected people, by increasing their capacity to cope, and tackling the root causes of vulnerability, which can be the underlying social, economic, institutional, and political structures.

1. Modelling and early warning systems

Establishment of early warning systems

11. An important component of a management plan for drought is the provision of timely and reliable climate information. This information, if properly used, can reduce the impacts of drought.[12] For example, in Mongolia, herders can listen and make use of weather forecasts to maintain agricultural and livestock production. In the past, drought management plans have often been implemented through a reactive approach. However, more pro-active risk-based management approaches, including early warning systems, allow for better drought prediction, monitoring, and adaptation.[13]

12. Early warning systems are used to detect signs of changes in weather and climate. These systems usually integrate precipitation and other climatic parameters with water information such as groundwater levels and soil moisture into a comprehensive assessment of current or forecasted drought and water supply conditions.[14] In general, early warning systems can include forecasts, trends and projections, and scenario development in order to identify slow and or rapid onset risks. For the purpose of early warning systems, risk can be defined as, "the probability of harmful consequences, or expected losses (deaths, injuries, damaged property, livelihoods and environment, and disrupted economic activity resulting from interactions between natural or human-induced hazards and vulnerable conditions. Conventionally, risk is expressed by the notation Risk = Hazards x Vulnerability."[15]

13. The FAO Global Information and Early Warning System on Food and Agriculture (GIEWS) is an example of an early warning system operating at the global level. An example of a regional system is the USAID- sponsored Famine Early Warning System (FEWS NET), focusing mainly on Africa, but also covering parts of Central Asia, Central America, and the Caribbean. At the national level, some countries, such as China, Australia, and the United States, have developed drought monitoring systems, often based on a single indicator or climatic index.[16]

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[12] Wilhite, D.A. Sivakumar, M.V.K., and D.A. Wood. Early warning systems for drought preparedness and drought management. Proceedings of an expert group meeting, 5-7 September 200, Lisbon, Portugal. Accessed at: http://www.unisdr.org/eng/library/Literature/7819.pdf

[13] Economic and Social Council. Commission on Sustainable Development. Seventeenth session. 4-15 May 2009. Policy options and actions for expediting progress in implementation: Drought. Report of the Secretary-General. E/CN.17/2009/6. Accessed at: http://www.un.org/esa/sustdev/csd/csd17/docu/csd17_6.pdf

[14] Wilhite, D.A. Sivakumar, M.V.K., and D.A. Wood. Early warning systems for drought preparedness and drought management. Proceedings of an expert group meeting, 5-7 September 200, Lisbon, Portugal. Accessed at: http://www.unisdr.org/eng/library/Literature/7819.pdf

[15] Inter-Agency Secretariat of the International Strategy for Disaster Reduction (UN/ISDR), 2004.Living with Risk**:** global review of disaster reduction initiatives 2004 version.

[16] Economic and Social Council. Commission on Sustainable Development. Seventeenth session. 4-15 May 2009. Policy options and actions for expediting progress in implementation: Drought. Report of the Secretary-General. E/CN.17/2009/6. Accessed at: http://www.un.org/esa/sustdev/csd/csd17/docu/csd17_6.pdf

14. There is also a role for long term ecological monitoring within early warning systems, especially with regards to assessing baseline conditions and initial vulnerability. For example, the Long Term Ecological Monitoring Observatories Network (ROSELT/OSS) has been established in the Sahara and Sahel regions in order to better assess and monitor desertification phenomenon. Designed to support implementation of UNCCD, ROSELT/OSS assesses both trends in ecological systems and the links between ecological and socio-economic systems.[17] In addition to ecological monitoring, proxy indications of risk and vulnerability can be applied to biodiversity. These include established early warning systems for livestock (such as the Livestock Early Warning System (LEWS)[18] and the Livestock Information Network Knowledge System (LINKS)[19]) and for water (such as drought early warning systems targeted at reservoir management[20]).

15. Lessons learned from the development of early warning systems indicate that:[21]

(a) Early warning systems should be designed so that they can be used at the community level, particularly by herders and pastoralists;

(b) There is a need to integrate local knowledge of drought to scientific early warning systems, with appropriate local monitoring and planning;[22]

(c) Early warning systems must be paired with drought management strategies that allow for flexible responses to drought conditions;

(d) Early warning systems should consider not just physical components of risk but also social, economic and political contributors;

(e) The complementarity between ecological early warning systems and meteorological based seasonal early warning systems for crop production and livestock range should be considered;

(f) It is important to retain continuity of early warning systems even during low risk periods;

(g) Warnings must be delivered in time to allow for a response or mitigation strategy to be put in place;

(h) There is a need to clearly define the tipping points which will be adhered to;

(i) It is important that early warning systems are designed as a broad response to hazards rather than simply as a response to the last disaster.

Climate change modelling

16. Since desert margins, tropical drylands and wetlands in drylands have been identified as being particularly vulnerable to the negative impacts of climate change, a proactive approach to land and water management considering projected changes in precipitation patterns is essential. In such a regard, climate change models can be viewed as important management tool for drylands biodiversity. Climate change models do, however, have many limitations. In many areas, down-scaled models are not available or are not sufficiently accurate to reflect actual changes. It is particularly difficult to down-scale precipitation changes as such changes are often very heavily impacted by micro-climates and local topography. In addition, there are very few climate change models that have been combined with multi-stressor biological models.

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[17] Sahara and Sahel Observatory. http://www.enviroinfo2004.org/cdrom/Datas/Paper_OSS_EnviroInfo2004.htm

[18] http://cnrit.tamu.edu/lews/description.html

[19] http://links.tamu.edu/Pages/Public/Home.aspx

[20] Wen-Cheng Huang and Chia-Ching Chou. Risk-based drought early warning system in reservoir operation. Advances in Water Resources Volume 31, Issue 4, April 2008, Pages 649-660.

[21] Glantz, M.H. Early Warning Systems Do's and Don'ts: Report of Workshop 20-23 October, 2003. Shanghai, China.

[22] Economic and Social Council. Commission on Sustainable Development. Seventeenth session. 4-15 May 2009. Policy options and actions for expediting progress in implementation: Drought. Report of the Secretary-General. E/CN.17/2009/6. Accessed at: http://www.un.org/esa/sustdev/csd/csd17/docu/csd17_6.pdf

2. Other management options

17. A number of other management options based on the conservation and sustainable use of biodiversity can reduce drought risks and, therefore, should be considered in drought management planning and implementation. These include integrated land and water management (the application of the ecosystem approach), conservation and management of key natural resources, traditional knowledge, innovations and practices, and the use of agricultural biodiversity.

Enhanced implementation of integrated land and water management

18. Measures that protect soils from erosion, salinization, and other forms of soil degradation effectively prevent desertification and reduce the vulnerability of ecosystems to droughts. Practices such as overgrazing, overexploitation, and unsustainable irrigation exacerbate dryland vulnerability. Land management strategies to reduce vulnerability include rotational use of rangelands, matching stocking rates to the carrying capacity of ecosystems, developing management plans for wetlands in drylands and favouring diverse species composition. It is important to mainstream integrated land and water management for food security and poverty reduction. Improved water management practices to reduce vulnerability include the use of traditional water-harvesting techniques, water storage, and diverse soil and water conservation measures. Improving groundwater recharge through soil-water conservation, upstream revegetation, and floodwater spreading can provide reserves of water for use during drought periods.[23]

19. Understanding water needs across sectors is an important pre-condition to the implementation of integrated land and water management policies. Building such an understanding and responding through the sustainable management of wetlands in drylands (including oases) can also help to avoid conflicts over water use. For example, in Kenya drought has led to conflict between farmers and pastoralists resulting in pastoralists moving into protected areas during times of extreme drought as such sites are among the only areas where water is available but agriculture is excluded.

Conservation and management of natural resources

20. The protection of the biodiversity of dry and sub-humid lands is important in combating land degradation and desertification. It can also provide income generating opportunities for dryland communities and contribute to poverty eradication,[24] although it is often necessary to support such opportunities through activities such as improving access to markets, providing payments for ecosystem services, and establishing labelling for sustainably harvested products. Furthermore, the conservation of locally-adapted species of plants and animals can increase the resilience of the ecosystem in the face of drought. For example, droughts have been demonstrated to have a more significant impact on imported livestock species when compared to local varieties or wild relatives (although this may not affect their relative productivity over the long term).

21. Maintaining the vegetative cover to protect soils from wind and water erosion is a key preventive measure against the loss of ecosystem services during drought episodes.[25] Where restoration is required, it is important to protect the site from further disturbance, collect seed stocks and encourage natural regeneration where it is occurring, control weedy species, and then develop a full restoration plan defining restoration objectives within the framework of the intended outcome, budget available and views

[23] Millennium Ecosystem Assessment, 2005. Ecosystems and Human Well-being: Desertification Synthesis. World Resources Institute, Washington, DC.

[24] Economic and Social Council. Commission on Sustainable Development. Seventeenth session. 4-15 May 2009. Policy options and actions for expediting progress in implementation: Drought. Report of the Secretary-General. E/CN.17/2009/6. Accessed at: http://www.un.org/esa/sustdev/csd/csd17/docu/csd17_6.pdf

[25] Millennium Ecosystem Assessment, 2005. Ecosystems and Human Well-being: Desertification Synthesis. World Resources Institute, Washington, DC.

of relevant stakeholders. As with the above, conservation and restoration efforts which use local species can yield more positive results in terms of drought management.[26]

22. Inland wetlands are an important land and water interface and can therefore mitigate the effects of the hydro-climatic variations associated with droughts. Inland water bodies are a strategic source of water and their conservation can help increase resilience of semi-arid countries and water stressed communities.[27] When developing management plans for inland waters, however, it is important to consider the needs of all relevant stakeholders including commercial and private users as well as the needs of biodiversity supported by the system. In this regard there may be scope to also consider users over various time scales in order to adequately capture the needs of seasonal users.

Integration of traditional knowledge, innovations and practices

23. An essential element of drought management plans is building the resilience of farming and pastoral communities and the resilience of landscapes. Indigenous and local communities have an important role to play through effective dryland resource management and in particular water management, which is often based on local decision-making structures and conflict resolution mechanisms.[28] Indigenous and local communities also use seed, crop and animal diversity as a portfolio against weather extremes including drought and climate change. As such, many local communities have a well-developed knowledge of plant and animal biodiversity which can support conservation and sustainable use efforts. Women are also important holders of biodiversity knowledge relevant for drought management and are often responsible for managing water resources. As such, efforts to involve women in decision-making processes can form an important element of drought management planning.

24. In many cases it is the local communities that are in the best position to implement practices to prevent desertification and to manage drought.[29] It is important, when considering traditional knowledge, innovations and practices, to recognize the impact of climate change on such elements. As climate change shifts temperature and precipitation patterns, some indigenous peoples are facing climatic conditions that have not previously been encountered on a regular basis. These conditions, which differ from those on which traditional knowledge is based, may erode traditional knowledge and associated drought management practices placing additional pressures on already stressed systems.

Improved use of agricultural biodiversity

25. Another element of drought management is addressing food security. Therefore, some countries look to increase access to drought-tolerant crop varieties in drought-affected regions.[30] This includes both identifying varieties with lower water requirements and varieties with higher salt tolerance (in response to increased salinization associated with irrigation and drought). In order to take advantage of such genetic resources, however, it is important to conserve wild races of common crops. Such conservation can take place either *in situ* through the protection of areas where such wild races can be found, or *ex situ* through mechanisms such as seed banks. Current efforts such as the Svalbard Global Seed Vault and the Millennium Seed Bank Project of the Royal Botanic Gardens, Kew, aim at protecting *ex-situ* collections of important plants. In fact, it is anticipated that by 2010, seeds will have been banked from approximately 10 per cent of the world's wild plant species.

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[26] Bainbridge, B. A Guide for Desert and Drylands Restoration: New Hope for Arid Lands. Society for Ecological Restoration International. 2007.

[27] Economic and Social Council. Commission on Sustainable Development. Seventeenth session. 4-15 May 2009. Policy options and actions for expediting progress in implementation: Drought. Report of the Secretary-General. E/CN.17/2009/6. Accessed at: http://www.un.org/esa/sustdev/csd/csd17/docu/csd17_6.pdf

[28] http://intranet.iucn.org/webfiles/ftp/public/ForumEvents/E0636/Final%20Document/636_Mizyed_B_Traditional%20practices%20of%20adaptation%20to%20climate%20change%20and%20variability.pdf

[29] Millennium Ecosystem Assessment, 2005. Ecosystems and Human Well-being: Desertification Synthesis. World Resources Institute, Washington, DC.

[30] Consultative Group on International Agricultural Research (CGIAR). Drought-Tolerant Crops for Drylands. Accessed at: http://www.cgiar.org/impact/global/des_fact2.html

26. In addition, regional efforts to improve the drought tolerance of crops can be effective when considering the scope and scale of most droughts which cross national borders. In this regards, programmes for drought management under the International Centre for Agricultural Research in the Dry Areas (ICARDA), such as the Network on Drought Management for the Near East, Mediterranean and Central Asia, which are combined with programmes for seed development, such as the International Germplasm Testing Network, have an important role to play in ensuring that agricultural biodiversity is used effectively in drought management. The conservation and sustainable use of agricultural biodiversity through methods such as agro-forestry, conservation tillage, intercropping, etc, can also reduce vulnerability from drought. In particular, such practices in managed ecosystems can help maintain vegetative cover, conserve soil biodiversity and provide alternative sources of food and fodder during times of drought, thereby reducing off-farm pressures on biodiversity and associated ecosystem services.

3 Applying the precautionary approach

27. Given uncertainties with regards to how climate change and desertification will interact with drought to impact the biodiversity of dry and sub-humid lands, the precautionary approach could be applied to drought management techniques in order to reduce the likelihood of catastrophic impacts.[31] In fact, proactive risk-based approaches for drought management have proven to be effective in reducing the physical or economic losses associated with drought, especially in the face of climate change and variability. Such approaches, at their most effective, include risk assessment, impact assessment and impact management strategies.

28. In particular, when considering the threshold at which to issue an early warning alert, applying the precautionary approach may involve lowering the threshold in combination with establishing a feedback loop to monitor actual impacts or conditions. Furthermore, in the case of water management, applying the precautionary approach may involve setting withdraw allotments at a level so as to allow for a buffer in case of reduced flow, including through establishing the minimum flow requirements to maintain healthy riparian ecosystems. Regardless, in any case in which the precautionary approach is applied, an adaptive management system should be adopted to ensure that movement from one level of warning or intervention to another is taken at the appropriate time and under appropriate conditions.

4. Addressing obstacles to effective implementation

29. There remain, however, a number of obstacles preventing the effective implementation of drought management activities. In his report to the seventeenth meeting of the Commission on Sustainable Development,[32] the Secretary General outlined the following gaps: (i) weak institutional structures; (ii) lack of technical capacity; (iii) limited stakeholder participation and investment; (iv) lack of awareness on the importance of drought management; and (v) inadequate consideration of social considerations (age, gender, etc.).

[31] Heads Up! Early Warning Systems for Climate, Water and Weather-Related Hazards. Edited by Michael H. Glantz. May, 2009.

[32] http://daccessdds.un.org/doc/UNDOC/GEN/N08/651/89/PDF/N0865189.pdf?OpenElement

III. FURTHER DEVELOPMENT OF PROPOSALS FOR FUTURE ACTION TO PROMOTE THE ACHIEVEMENT OF THE 2010 BIODIVERSITY TARGET WITH RESPECT TO DRY AND SUB-HUMID LANDS CAPACITY CONSTRAINTS

30. Capacity constraints, whether in terms of financial, human or institutional capacity, were identified during the in-depth review of implementation of the programme of work as limiting broad and effective implementation. Accordingly the following activities were recommended for the Secretariat.

Supporting activities for the Secretariat	***Report on Progress***
Support synergies through the Joint Liaison Group, Biodiversity Liaison Group and other mechanisms	The CBD Secretariat has participated in meetings of the Joint Liaison Group and the Biodiversity Liaison Group as well as UNCCD Inter-agency Taskforce on Harmonized Reporting
Provide case-studies and best practices on incentives and policy frameworks	The Secretariat has established an incentives measures database (https://www.cbd.int/incentives/case-studies.shtml) with 50 case-studies relevant for dry and sub-humid lands
Continue to provide capacity-building support through the regional workshops on national biodiversity strategy and action plans	Since the ninth meeting of the Conference of the Parties, the Secretariat has convened 12 regional and subregional workshops on national biodiversity strategy and action plans although none had a particular focus on dry and sub-humid lands.
Provide information on the 2010 target within the framework of the Millennium Development Goals	The Secretariat has developed a partnership with UNDP which includes the integration of the 2010 target within efforts to achieve the Millennium Development Goals although there has been no specific focus on the biodiversity of dry and sub-humid lands.
Disseminate information on innovative funding mechanisms	In accordance with decision IX/11, an International Workshop on Innovative Financial Mechanisms was held in Bonn, from 27-29 January 2010. The workshop was organized in collaboration with The Economics of Ecosystems and Biodiversity (TEEB) Secretariat to assess the status of knowledge and related use concerning innovative financial mechanisms at all levels as identified by the Conference of the Parties, and develop policy options concerning innovative financial mechanisms. The issues considered include: payment for ecosystem services, biodiversity offsets, environmental fiscal reforms, market for green products, business-biodiversity partnerships and charity, new and innovative sources of international development finance, and climate change funding, and biodiversity.
Support South-South cooperation and other mechanisms for focal points to exchange experiences and lessons learned	The Secretariat has supported the development of a multi-year plan of action on South-South Cooperation with the Group of 77 although there has been no particular focus on the biodiversity of dry and sub-humid lands. In fact, thus far the Secretariats support for South-South Cooperation has largely focused on forest ecosystems.

31. Lessons learned from the implementation of the above activities by the Secretariat include:

(a) The need to increase political will with regards to implementation of the programme of work on the biodiversity of dry and sub-humid lands; and

(b) The need to better link capacity building for the programme of work on the biodiversity of dry and sub-humid lands with similar efforts for the programme of work on inland waters biodiversity.

32. With regard to activities to be implemented by Parties, the fourth national reports to the Convention on Biological Diversity contain no specific information on the capacity-building activities, but an assessment of the reports reveals that little progress has been made with regard to addressing

capacity constraints within the framework of the programme of work on the biodiversity of dry and sub-humid lands. Nevertheless, some good-practice examples can be drawn from the national reports including:

(a) The development of new legislation addressing land degradation and associated biodiversity loss in dry and sub-humid lands (e.g. the Afghan draft Rangeland Law); and

(b) The development of training programmes on managing biodiversity and addressing desertification (e.g., Yemen).

33. Additional capacity constraints identified by Parties include a lack of financial capacity and weak integration of biodiversity within plans and programmes for sustainable land management. Parties also recognize the lack of technical capacity with regards to the biodiversity of dry and sub-humid lands including with regards to management, taxonomy and monitoring and evaluation.

A. Assessment of lessons learned to address capacity constraints

34. In light of the above, the Secretariat has continued to organize regional and subregional capacity development workshops on implementing national biodiversity strategy and actions plans (NBSAPs) and mainstreaming biodiversity. These workshops have revealed a number of lessons learned with regards to addressing capacity constraints including the need for: (i) linking NBSAPs to development; (ii) mainstreaming biodiversity into economic sectors; (ii) involving local communities in biodiversity decision-making; (iii) integrating biodiversity into economics including through payments for ecosystem services.

35. A number of other partners have also been actively engaged in capacity-building and have, as a result, developed lessons learned. For example, through capacity-building efforts in sub-Saharan Africa, the World Bank[33] recognized the importance of:

(a) A holistic approach to capacity building including strengthening public institutions, improving public financial management, decentralization, and governance;

(b) A variety of financial instruments to support capacity-building;

(c) A programmatic approach to capacity-building;

(d) Integrating capacity-building within sector planning;

(e) Linking institutional, organizational, and human capacity developments.

36. With regards to implementation by Parties, the lack of financial resources remains the most commonly cited capacity constraint within national reports. This constraint refers to both funding in national budgets and funding through overseas development assistance. Some success has, however, been achieved in funding for regional programmes towards implementation of the programme of work and funding for protective ecosystem services (such as protection from flood, drought and climate change) which may be an area for further action.

37. In addition to the above-mentioned activities, a number of activities for Parties were identified as important if obstacles to implementation of the programme of work are to be addressed including: establishing an institutional environment for synergies, enhancing stakeholder participation, and addressing financial and human capacity constraints.

B. Establishing an institutional enabling environment for synergies

38. With regards to implementation of activities to build an enabling environment for synergies, the establishment of communication strategies and procedures between decision makers and stakeholders is the most widely reported activity within the fourth national reports submitted under the Convention on Biological Diversity. This includes the development of communication networks on single issues such as

[33] http://www.worldbank.org/oed/africa_capacity_building/

desertification (e.g., Algeria, Mauritania, Mongolia and Sudan) as well as strategies to address sustainable use (e.g. Cameroon and China). Other areas covered by communication strategies include the importance of the ecosystem services provided by wetlands in drylands (e.g. Kenya).

39. Parties also reported a number of activities to coordinate different stakeholders and avoid overlap including through national committees (e.g. Afghanistan and Uganda) and the inclusion of dry and sub-humid land biodiversity issues in broader national and sector planning (e.g. Ghana, Guinea and Mongolia). A number of successes were also reported with regards to coordinating NBSAPs and NAPs (e.g. Burundi, Chile, Cote d'Ivoire, Djibouti, Guinea, Hungary, India, Italy, Lebanon, Madagascar, Mongolia, Morocco, South Africa, Tunisia and Vietnam).

40. Gaps in implementation of the above activities largely revolve around livelihoods and economic valuation as well as the identification of perverse incentives and payments for ecosystem services. It is also unclear to what extent Parties are instituting appropriate hand over policies for national focal points.

C. Assessment of lessons learned to establish an institutional enabling environment

41. Many of the successes in establishing an institutional enabling environment revolve around the coordination of the different agencies and institutions involved in national planning to address biodiversity loss, desertification and climate change. In fact, enhanced coordination of different levels of stakeholders has been one of the main focuses of the NBSAP workshops organized by the Secretariat of the Convention on Biological Diversity. Some successful approaches to ensure that such coordination exists include the development of national committees to design and implement NBSAPs as well as the development of sub-national NBSAPs (e.g. India).

42. With regards to remaining gaps, the NBSAP workshops have revealed that coordination across sectors and levels of government is often planned on paper but may not be implemented as a result of a lack of staff or a lack of time.

43. In terms of the involvement of different stakeholder groups, the most commonly targeted sectors involved in establishing an enabling environment include grazing and rangeland management and agriculture. There is, however, little information reported at the national level on possible conflicts between biodiversity conservation and sustainable use, and herding and agriculture in dry and sub-humid lands.

44. Other lessons learned in the establishment of an institutional enabling environment include the need for an adequate baseline assessment of threats to the biodiversity of dry and sub-humid lands in order to identify relevant obstacles to implementation of the programme of work, including perverse incentives and conflicting policies across different sectors.

45. As with the previous activities, the development and implementation of regional programmes, such as the Green Diplomacy Programme funded by the Government of Finland and UNDP's Country Pilot Partnerships for Integrated Sustainable Land Management have demonstrated successes in establishing institutional enabling environments.

D. Enhancing stakeholder participation

46. An assessment of activities to promote stakeholder participation in the implementation of the programme of work on the biodiversity of dry and sub-humid lands indicates broad implementation of relevant activities. This includes:

(a) Specific projects targeting conflicts between sectors (e.g. biodiversity conservation and mining in Australia);

(b) The engagement of indigenous and local communities within dry and sub-humid lands (e.g. Canada, India, Kenya, Lebanon and South Africa);

(c) The establishment of partnerships with private land owners in dry and sub-humid lands (e.g. Canada); and

(d) Broader engagement of non-governmental organizations working in dry and sub-humid lands (e.g. Yemen).

47. With regards to the enhanced engagement of stakeholders, the lack of information of the valuation of the ecosystem services provided by the biodiversity of dry and sub-humid lands remains a significant obstacle, especially when considering the engagement of extractive industries, the forestry sector and private land owners.

E. Lessons learned to enhance stakeholder participation

48. Parties reporting success with regards to stakeholder participation in implementation of the programme of work on the biodiversity of dry and sub-humid lands often focus participation on a single issue such as the conservation of indigenous grasses (e.g. Canada) or the dissemination of relevant technologies (e.g. India). In some cases, enhanced stakeholder participation first requires capacity-building for local institutions (e.g. Lebanon). Such capacity-building can take the form of institutional capacity-building including the establishment of new bodies or training for members of existing institutions, as well as building enabling environments through devolving decision-making to local institutions or the recognition of local conflict resolution mechanisms.

49. Enhanced stakeholder participation also benefits from the recognition of the importance of traditional knowledge to the implementation of the programme of work (e.g. Kenya). Such recognition can benefit from corresponding efforts to record such knowledge, such as the Royal Botanic Gardens Kew seed bank programme, as long as such efforts adopt the principles of prior and informed consent. Once again regional programmes have a role to play in engaging stakeholders, especially when considering the conservation and sustainable use of migratory species and the management of transboundary waterways. The Nile Basin Initiative provides an example of a successful regional programme to mange a transboundary waterway although the establishment of the initiative did take a number of years and was reliant upon the establishment of clear funding streams and support from the highest government levels.

F. Addressing financial and human capacity constraints

50. The analysis of fourth national reports reveals that financial and human capacity constraints remain significant obstacles to the implementation of the programme of work on the biodiversity of dry and sub-humid lands although significant progress has been made with regards to identifying specific gaps through national capacity self assessments (NCSAs). In particular, a number of Parties reported specific efforts to link the three Rio conventions through NCSAs (e.g. Sri Lanka and Uganda) implying a particular focus on addressing capacity constraints in dry and sub-humid lands.

51. Gaps remain, however, with regards to the establishment of a baseline against which the achievement of the 2010 target can be assessed for dry and sub-humid lands, as well as in implementing innovative financing options and establishing the value of ecosystem services provided by dry and sub-humid lands.

G. Lessons learned in addressing financial and human capacity constraints

52. Resources for the implementation of the Rio conventions is limited, as such, in order to address financial and human capacity constraints a number of Parties have focused on identifying opportunities for synergies and win-win situations. Turkmenistan, for example, has drawn a clear link in its policy development between the programme of work on the biodiversity of dry and sub-humid lands and Article 6 in Appendix 4 of UNCCD.

53. Other Parties have set specific targets in addition to the 2010 target in order to address the particular challenges faced in implementing the Convention on Biological Diversity in dry and sub-humid lands. For example, Botswana set a target for dryland biodiversity for economic growth and the maintenance of an ecological balance.

H. Weak collaboration/coordination

54. Weak collaboration and coordination between different stakeholders responsible for implementation of the Convention on Biological Diversity and between different stakeholders responsible for the implementation of the Rio conventions was identified during the in-depth review of implementation of the programme of work as limiting the broad and effective implementation of the programme of work. Accordingly, the following activities were recommended for the Secretariat.

Supporting activities for the Secretariat	*Report on progress*
Provide case-studies and best practices on coordination mechanisms	Case-studies on mainstreaming have been gathered through the subregional workshops on NBSAPs. These case-studies are available online at: http://www.cbd.int/doc/publications/cbd-brochure-nbsap-ws-en.pdf
Provide information on the 2010 target for the general public through, for example, the Global Biodiversity Outlook	The third edition of the Global Biodiversity Outlook will be published in 2010.
Continue to support the development and adoption of guidance on the ecosystem approach	The ecosystem approach was considered for in-depth review at the ninth meeting of the Conference of the Parties and further guidance was developed by Parties.
Support the participation of indigenous and local communities in relevant meetings under the Convention	A special fund has been set-up to support the participation of indigenous and local communities in CBD meetings.

55. Lessons learned from the implementation of the above activities by the Secretariat include:

(a) The importance of ensuring the adequate dissemination of relevant information including workshop reports, publications, case-study databases, etc.;

(b) The need to engage a variety of partners, including non-governmental organizations, in identifying representatives of indigenous and local communities give that, in dry and sub-humid lands, such groups are often migratory and/or marginalized within national and international political processes.

56. With regards to activities to be implemented by Parties, an analysis of the fourth national reports reveals that collaboration between stakeholders involved in the implementation of the Convention on Biological Diversity and those involved in implementation of UNCCD is quite strong. Some mechanisms reported by Parties to achieve such collaboration include:

(a) Specific projects to restore and maintain the ecosystem services provided by dry and sub-humid lands for the benefit of biodiversity and so as to combat desertification and land degradation (e.g., Afghanistan, Algeria, Armenia, Cameroon, Italy, Lebanon, Madagascar, Mali, Mauritania, Morocco, Nepal, Republic of Moldova, South Africa and Tunisia);

(b) The development and implementation of strategic frameworks or programmes to address biodiversity loss and desertification (e.g., Guinea).

57. No Parties reported on the application of the ecosystem approach in dry and sub-humid lands, however, a review of specific projects reveals that the principles of the ecosystem approach are being adopted in some cases. Furthermore, no Parties reported on the engagement of marginalized groups in implementation of the programme of work on the biodiversity of dry and sub-humid lands.

Lessons learned from collaboration and cooperation

58. Lessons learned in implementation of the above activities reveal the importance of long-term, programmatic funding for projects addressing biodiversity loss and desertification and land degradation. Furthermore, national committees consisting of national focal points from both the Convention on Biological Diversity and UNCCD can improve the effectiveness of programmes to address both issues

such as in Uganda where a national committee consisting of representatives from multiple ministries has been established to support the implementation of all multilateral environmental agreements. Finally, a number of Parties have recognized the link between implementation of the programme of work on the biodiversity of dry and sub-humid lands and disaster management (e.g., Afghanistan and Algeria).

I. Gaps in scientific and technical knowledge

Supporting activities for the Secretariat	*Report on progress*
Support the exchange of knowledge, best practices and lessons learned through forums such as the Clearing-House Mechanism	A discussion forum on dry and sub-humid lands was established through the clearing-house mechanism at www.cbd.int/drylands/forum.shtml to facilitate the exchange of knowledge and experience. However, participation from the community of practice has been poor.
Disseminate, as widely as possible the outputs and findings of the Biodiversity Indicators Partnership	The findings of the 2010 Biodiversity Indicators Partnership are accessible from http://www.twentyten.net and are being summarized in the third edition of Global Biodiversity Outlook and reflected in a range of information products to be issued in the course of the International Year of Biodiversity.
Update the case-study database on capacity-building, partnerships and land- use options in dry and sub-humid lands	The case-study database has been updated including through the addition of case-studies to fill the previous gap with regards to pastoralism as a land-use option
Support synergies on adaptation, biodiversity and land degradation through the Joint Liaison Group	The Joint Liaison Group continues to explore options for synergies. Minutes of the meetings are available at: http://www.cbd.int/cooperation/liaison.shtml

59. Lessons learned from implementation of the above activities reveal that the case-study database on the biodiversity of dry and sub-humid lands is not widely used. In fact, during the period from 1 November 2008 to 31 October 2009 the case-study database was only visited 407 times by 215 unique viewers. The Secretariat is, however, exploring ways and means to improve knowledge management including through the website. Furthermore, with regards to collaboration with the Joint Liaison Group, differing mandates from the three Rio convention processes and a lack of additional resources to carry out joint activities makes cooperation more difficult. With regards to activities to be implemented by Parties, Parties emphasized the importance of establishing an adequate knowledge base with regards to desertification, land degradation and biodiversity loss in dry and sub-humid lands. In fact, the lack of such information has been identified as an obstacle to the assessment of progress towards the achievement of the 2010 target.

60. Activities to address knowledge gaps in dry and sub-humid lands include the establishment of targeted research centres, such as Australia's Centre for the Management of Arid Environments, Cameroon's National Observatory on Desertification, as well as the implementation of specific knowledge gathering projects (e.g., Cambodia, Canada, China, Ghana, India, Lebanon, Mongolia, Indonesia, Uganda and Yemen). Some Parties have mainstreamed information gathering on the biodiversity of dry and sub-humid lands within broader national environmental observation programmes (e.g., South Africa).

Lessons learned in addressing gaps in scientific and technical knowledge

61. Parties identified a number of remaining gaps in scientific and technical knowledge related to the biodiversity of dry and sub-humid lands including:

(a) The need for additional work on early warning systems;

(b) The need for further mapping programmes for dry and sub-humid lands (including mapping the extent of desertification and land degradation); and

(c) The need for addition work to capture traditional knowledge with regards to the sustainable management of dry and sub-humid lands (under the principle of prior and informed consent).

J. Gaps in public awareness

Supporting activities for the Secretariat	*Report on progress*
Provide training opportunities back-to-back with relevant meetings	A toolkit on biodiversity, pastoralism and development was published in collaboration with relevant partners. Training linked to this toolkit back-to-back with relevant meetings is planned but has not yet been implemented.
Provide materials to Parties for the celebration of the International Day for Biodiversity	A factsheet on the biodiversity of dry and sub-humid lands has been prepared for 2010 as the International Year for Biological Diversity.

62. As with many of the other supporting activities for the Secretariat, although information has been made available to Parties on the 2010 target and the International Day for Biodiversity this information has not been targeted specifically at the biodiversity of dry and sub-humid lands. Furthermore, when dry and sub-humid lands has been suggested as a theme for training or capacity building workshops (e.g. subregional NBSAP workshops) there has been little interest expressed by the participating Parties. Furthermore, since the ninth meeting of the Conference of the Parties no meetings on the theme of dry and sub-humid lands have been convened by the Secretariat. With regards to relevant meetings convened by partner organizations, the lack of resources to facilitate the publication of training material and travel of trainers has limited opportunities. Alternative mechanisms for providing training, such as through the CBD website or the distribution of material on CD-ROM, are continuing.

63. With regards to activities to be implemented by Parties, through their fourth national reports Parties reported on awareness raising activities at both the national and regional levels including:

(a) A mandate for training and awareness raising within UNCCD NAPs (e.g. China);

(b) The implementation of environmental education projects specific to dry and sub-humid lands (e.g. Mongolia); and

(c) The establishment of training programmes at the regional level (e.g. Sweden).

Lessons learned in addressing gaps in public awareness

64. Parties emphasized the importance in developing partnerships for awareness raising including between the national government and non-governmental organizations (e.g. Sudan) as well as between environment and education ministries.

IV. REPORT ON THE COLLABORATION IN PASTORALISM AND AGRICULTURAL USE OF DRY AND SUB-HUMID LANDS

65. The Executive Secretary in collaboration with FAO and UNCCD produced a good practice guide on pastoralism, nature conservation and development, which is available at https://www.cbd.int/development/doc/cbd-good-practice-guide-pastoralism-booklet-web-en.pdf. The guide addresses the linkages between pastoralism, biodiversity, and development/poverty reduction. The guide outlines the status and trends of biodiversity in areas impacted by pastoralism and introduces decision-makers to some techniques, technologies and procedures that optimize the social and environmental outcomes of pastoralism and minimize negative impacts. It also presents good practice examples on the interface between pastoralism, poverty reduction and biodiversity. This may assist Parties to the Convention on Biological Diversity in establishing national and subnational pastoralism development policies, strategies, plans and projects that consider poverty reduction and biodiversity conservation. The guide also provides sources and references for more detailed information.

66. The Executive Secretary also collaborated with IUCN on the production of a report on pastoralism, biodiversity and climate change. The report is a compilation of experiences in the field of climate change mitigation and adaptation, soil management and pastoralism in dry and sub-humid lands. The report presents a number of examples of good practice in addressing the likely or actual impacts of climate change related hazards. The report also stresses the importance of an array of changes that

threaten or may enhance pastoral livelihoods: changes to which pastoralists were struggling to adapt before the threat of climate change became apparent. The report proposes that adaptive capacity is the central pillar of pastoral livelihoods, and pastoral poverty and related environmental stresses can be traced to loss of this adaptive capacity and increased vulnerability.

67. Ongoing collaboration on pastoralism and agricultural use of dry and sub-humid lands revealed the need to better engage pastoralists and small scale agricultural producers in implementation of the programme of work on the biodiversity of dry and sub-humid lands, including the development of national policies. Good practice examples of such approaches do exist, such as the Land Care Programme in Australia, from which lessons learned can be drawn.
