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Nairobi work programme on impacts, vulnerability and adaptation to climate change

Report on the workshop on adaptation planning and practices

Note by the secretariat*

Summary

This note provides a summary of the second workshop held under the Nairobi work programme on impacts, vulnerability and adaptation to climate change, which focused on adaptation planning and practices. The workshop was held in Rome, Italy, from 10 to 12 September 2007. Discussions at the workshop focused on sector-specific adaptation planning and practices in the areas of agriculture and food security, water resources, coastal zones and health as well as on how to integrate and coordinate adaptation planning and practices across different sectors and at different levels, including at subnational, national, regional and international levels. This note contains an overview of good practices, gaps and needs in adaptation planning and practices as well as recommendations and issues for follow-up and further consideration.

* This document was submitted after the due date owing to the timing of the workshop.

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I. Introduction

A. Mandate

1. The Subsidiary Body for Scientific and Technological Advice (SBSTA), at its twenty-fifth session, requested the secretariat,[1] under the guidance of the Chair of the SBSTA, to organize, before its twenty-seventh session, a workshop with the participation of Parties, relevant organizations, business, civil society, decision makers and other stakeholders, to exchange information and views on existing adaptation practices, experiences, needs, gaps, opportunities, barriers and constraints, and on the contribution of traditional knowledge to the work on adaptation planning and practices. The SBSTA further requested the secretariat to prepare a report on the workshop to be made available to it by its twenty-seventh session.

B. Scope of the note

2. This document provides information on the workshop referred to in paragraph 1 above. It draws upon the discussions, presentations and posters from the workshop as well as responses to a questionnaire on follow-up action for enhancing adaptation planning and practices.[2]

3. As requested by the SBSTA,[3] this document contains information on:

(a) Analysis of the issues addressed, including current status and lessons learned (see chapter III below);

(b) Summary of identified gaps, needs (including any capacity needs), opportunities (including possible synergy among activities), barriers and constraints (see chapter III below);

(c) Summary of recommendations (see chapter IV below).

4. The document concludes with issues for follow-up and further consideration, including suggestions made to address the recommendations, and next steps under the Nairobi work programme on impacts, vulnerability and adaptation to climate change.

C. Possible action by the Subsidiary Body for Scientific and Technological Advice

5. The SBSTA may wish to consider this workshop report at its twenty-eighth session as part of its general consideration of the outputs from prior activities and its consideration of further activities under the Nairobi work programme.

D. Background

6. The overall objective of the Nairobi work programme is to assist all Parties, in particular developing countries, including the least developed countries and small island developing States, to improve their understanding and assessment of impacts, vulnerability and adaptation, and to make informed decisions on practical adaptation actions and measures to respond to climate change on a sound, scientific, technical and socio-economic basis, taking into account current and future climate change and variability.[4]

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[1] FCCC/SBSTA/2006/11, paragraph 58.
[2] Documentation is available at <www.unfccc.int/4036.php>.
[3] FCCC/SBSTA/2006/11, paragraph 24.
[4] Decision 2/CP.11, annex, paragraph 1.

7. Activities in the area of adaptation planning and practices under the Nairobi work programme are undertaken in line with the objective stated in the annex to decision 2/CP.11, which is to advance sub-themes 3 (b) (ii), "Collecting, analysing and disseminating information on past and current practical adaptation actions and measures, including adaptation projects, short- and long-term adaptation strategies, and local and indigenous knowledge", and 3 (b) (iv) "Facilitating communication and cooperation among and between Parties and relevant organizations, business, civil society and decision makers, and other stakeholders".

II. Workshop proceedings

8. The secretariat, in collaboration with the Food and Agriculture Organization of the United Nations (FAO), organized the workshop on adaptation planning and practices in Rome, Italy, from 10 to 12 September 2007. The Governments of Australia, Canada, Germany, Japan, the Netherlands, Norway, Spain, Switzerland and the United Kingdom of Great Britain and Northern Ireland provided financial support for the organization of Nairobi work programme activities, including this workshop. Mr. Kishan Kumarsingh, Chair of the SBSTA, chaired the workshop.

9. Participants at the workshop included 140 representatives from: Parties; the three expert groups under the Convention, namely the Least Developed Countries Expert Group (LEG), the Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention (CGE) and the Expert Group on Technology Transfer (EGTT); relevant intergovernmental and non-governmental organizations (NGOs) that are active in the area of adaptation planning and practices; individual experts and practitioners; and the Chair of the Subsidiary Body for Implementation, Mr. Bagher Asadi.

10. An introductory session provided background information on recent developments in adaptation under the UNFCCC, the objectives of the Nairobi work programme and the mandate for the workshop, and included presentations on the information contained in the adaptation planning and practices submissions referred to in paragraph 11 below, relevant work from the expert groups and the perspective of FAO on adaptation planning and practices.

11. As requested by the SBSTA,[5] discussions at the workshop were informed by submissions[6] from Parties and organizations on adaptation approaches, strategies, practices and technologies for adaptation at the regional, national and local levels in different sectors, as well as on experiences, needs and concerns; by a report[7] synthesizing the submissions; by a synthesis report[8] based on outputs relevant to adaptation planning and practices from the work of the LEG, the CGE and the EGTT, and by the report on the workshop on climate-related risks and extreme events held in Cairo, Egypt, from 18 to 20 June 2007.[9]

12. The discussions at the workshop took place in four parallel breakout groups. The groups covered two broad areas: sector-specific adaptation planning and practices, and integration and coordination of adaptation planning and practices across different sectors and at different levels.

13. In the first round of breakout groups, sector-specific adaptation planning and practices were discussed in the areas of agriculture and food security, water resources, coastal zones and health. Those sectors were selected based on their importance to Parties and organizations as highlighted in their submissions. In the second round of breakout groups, discussions were focused on how to integrate and

[5] FCCC/SBSTA/2006/11, paragraph 58.
[6] Submissions from Parties and organizations are compiled in documents FCCC/SBSTA/2007/MISC.10 and FCCC/SBSTA/2007/MISC.11 and in an online database <http://maindb.unfccc.int/public/adaptation_planning>.
[7] FCCC/SBSTA/2007/9.
[8] FCCC/SBSTA/2007/10.
[9] FCCC/SBSTA/2007/7.

coordinate adaptation planning and practices across different sectors and at different levels, namely at subnational, national, regional and international levels.

14. In addition to participating in breakout group discussions, participants provided information on priority issues, gaps, needs and recommendations in responses to a questionnaire prepared by the secretariat under the guidance of the Chair of the SBSTA, and shared information, good practices and pledges for follow-up activities during plenary presentations and in a poster session.

15. The workshop concluded with a session bringing together the outcomes of the breakout groups. Suggestions were made on how to address identified gaps and needs. In addition, recommendations, possible next steps and follow-up actions under the Nairobi work programme were discussed.

III. Adaptation planning and practices in different sectors and at different levels

A. Introduction

16. Using the outcomes of the sectoral discussions at the workshop on climate-related risks and extreme events[10] as a starting point, participants undertook a stocktaking of adaptation planning, good adaptation practices, gaps and needs and developed recommendations for enhancing adaptation in different sectors and at different levels.

B. Adaptation planning and practices in and across different sectors

1. Agriculture and food security

17. Climate-related risks for agriculture include increases in temperature, water stress, land degradation and salinization, pest and disease outbreaks, and reduced precipitation and soil moisture. In terms of adaptation planning for climate-related risks and impacts, participants distinguished between long-term and short-term planning. Long-term adaptation planning aims at poverty reduction and providing alternative livelihoods such as farming goats (which are more resilient to changes in their environment) instead of cattle. Short-term adaptation planning builds upon disaster risk reduction and preparedness; an example is securing fodder prior to floods.

18. Regarding adaptation practices, participants discussed many successful strategies that are increasingly applied, including altering crop cultivars to enhance their drought and pest resistance, changing crops, planting times and cropping patterns, changing farming systems, for example, to combined crop–livestock–agroforestry, addressing water shortages through rainwater harvesting and irrigation, and introducing insurance schemes to assist in coping with crop losses.

19. However, many gaps and needs remain. Participants identified a gap between adaptation assessment and planning, on the one hand, and implementation on the other, which is due to a number of constraints including lack of capacity, data, information and resources. Regarding the provision of information and local data, farmers are not receiving the data they require to adapt their practices. Sometimes meteorological stations are close to farms but the data that are transmitted to and processed by the national meteorological offices are not disseminated locally. In other instances meteorological stations are located at strategic points such as airports where the data produced are less applicable to farming activities.

20. Weather forecasts and other ecological information are often broadcast over the radio. However, farmers require assistance on the ground in applying the information from people with climate change knowledge. Even where access to comprehensive information on the right scale exists, this does not

[10] Documentation from the workshop is available at <http://unfccc.int/3953.php>.

necessarily lead to successful adaptation on the ground. In Chile, for example, a study determined the maximum goat carrying capacity of an arid region, and farmers were provided with that information; however, the actual number of goats farmed remained 10 times higher, leading to erosion and land degradation.

21. Participants noted a number of conditions necessary to overcome barriers to adaptation in agriculture. Stakeholders in agriculture need to adopt more long-term strategies, which seek to incorporate local knowledge, sustain natural resources and diversify the agricultural system. Some cash crop industries have already undergone diversification; lessons learned should be shared. Climate change adaptation needs to be incorporated into development planning, for example by climate-proofing rural development plans, and institutions that deal with agriculture and food security. In order for institutions to plan successfully for adaptation in the agriculture sector, there should be a legal framework, capacity for cross-sectoral communication and information sharing, and an enabling environment for public–private partnerships, participatory planning involving local communities and decentralized decision-making.

22. In addition, farmers, support organizations for farmers and research institutes need to build capacity and expertise. There is a need to establish links between farmers and scientific and technical experts for exchanging information on agrometeorological conditions, for the development and performance of new crop varieties, and for assessing and responding to market conditions. Examples from Armenia and Mali have shown the success of such links. In trial projects, each field was split and one half was cultivated in the usual way while the other was cultivated using scientifically-optimized practices. The resulting yield increases in the latter half convinced farmers to adopt the optimized, more adaptive agricultural practice.

2. Water resources

23. The discussion on adaptation planning and practices in the water sector was based on identified climate-related risks and impacts, including droughts, flooding in coastal areas and inland water catchments, salinization of groundwater and increased temporal and spatial variability in precipitation.

24. Participants noted that adaptation planning in the water sector needs to be comprehensive and cross-sectoral as changes in water resources affect other sectors such as agriculture, health, energy and infrastructure. It was emphasized that consistency is needed in the plans of all the relevant ministries with regard to the sharing and rationing of water resources. For example, planning of economic diversification in the agriculture sector and the choice of production schemes should be guided by water needs.

25. Four important adaptation practices for the water sector were emphasized, namely protection of water supply infrastructure and traditional water supply sources, water harvesting, improving watershed management and slowing down salinization of water caused by sea level rise. Participants stressed that integrated management of water resources needs to include managing the supply side and the demand for water as well as on maintaining water quality.

26. For transboundary water resources it is important for adaptation planning and practices to take place at a regional or a water basin level. The engagement of transboundary communities is important for assessing the impacts of certain water policies; this could be achieved through regional river basin arrangements, such as the Nile Basin Initiative.[11]

27. Of the available planning approaches and tools, participants discussed integrated water resource management (IWRM), placing ecosystems at the core of land-use planning in order to ensure the sustainable delivery of good and services. Risk mapping and cost–benefit analysis were noted to be

[11] <http://www.nilebasin.org>.

useful planning tools and water basin management groups at district, state and national levels to be useful institutional tools to stimulate holistic planning.

28. Good practices for planning and practices were identified at all levels. At a regional level the European Union (EU) in its Water Framework Directive has established a comprehensive framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater. The framework incorporates adaptation in a number of ways: it seeks to reduce the effects of droughts and floods; it allows for periodic reviews of climate change related pressures on European water resources; and it employs economic instruments aimed at using water more efficiently. With regard to adapting to increasing salinity, Egypt has advanced in promoting rice planting in saline areas. An example from Turkey shows that adaptation to reduced water availability can be successfully achieved at the household level by adjusting the demand for water.

29. There remains a need for capacity-building, for socio-economic and observational data tailored to water sector planners, and for better understanding of adaptation options. In terms of socio-economic data to support decisions on adaptation in the water sector, the assessment of the economic value of water lacks widely accepted methodologies and basic data. Knowing the value of water and impacts of pricing of water on different stakeholders can be an important piece of information to force changes in water resource management. Water is too often regarded as an infinite resource; attitudes and behaviours need to be changed so that it is conserved. Likewise, water governance needs to be improved to enhance coordination and priority setting among different water users and reconcile water conflicts.

30. Participants noted that the availability of relevant observational data and adequate monitoring of all aspects of the hydrological cycle are critical for successful adaptation planning. For example, underground water is an important water source, especially in times of drought, but its dynamics, including aspects of recharge, movement between aquifers and process rates for salinization, are not well observed. Participants suggested that the effects of different adaptation options on the hydrological cycle need to be studied at different scales to assess overall water availability and quality. Similarly, relevant technologies, including those for reducing evaporation, for water purification and for desalinization, need to be better explored in terms of their costs, benefits and sustainability.

3. Coastal zones

31. Discussions on adaptation planning and practices for coastal zones were based on the risk assessment and management strategies identified for a number of coastal hazards and their impacts, including sea level rise leading to salinization and coastal erosion, cyclones leading to coastal flooding, and increased variability in ocean currents leading to changes in precipitation pattern.

32. Participants discussed the different components of adaptation needed in coastal zones, including the provision of data and information to inform the planning and design of adaptation practices and the implementation of specific measures. Many good practices were identified in adaptation planning. For example, the Caribbean Development Bank has developed a manual[12] to assist countries in integrating disaster risk reduction and adaptation into their planning processes using environmental impact assessments. The Orchid tool,[13] which is being piloted in Bangladesh, allows development planners to prioritize key planned and ongoing activities that present good opportunities for risk and vulnerability reduction through integrating disaster risk reduction and climate change adaptation within programme activities.

[12] <http://www.caribank.org/Publications.nsf/EIASourceBook/$File/SourceBook5.pdf>.
[13] <http://www.ids.ac.uk/ids/pvty/ClimateChange/pdfs/orchidfinal.pdf>.

33. Adaptation practices discussed include comprehensive approaches such as integrated coastal zone management (ICZM), technological solutions such as the construction of dykes and sea walls[14] and community practices such as the rehabilitation of degraded coastal zones with mangroves or the banning of plastic bags to prevent blocking of sewers and drains in times of flooding.

34. Regarding the provision of data and information, participants agreed that despite advancements in risk, vulnerability and adaptation assessments for coastal zones, many gaps and needs remain. There is limited understanding of the adaptive capacity of coastal zones. Adaptive capacity is determined by the relationship between coastal settlements and ecosystems, the natural adaptive capacity of ecosystems and other factors including physical features such as ice cover and social features such as extensive social networks. More information and research is also needed on unintended consequences of different adaptation measures, for example on how mangrove rehabilitation projects affect local economies.

35. Gaps and needs also remain in the areas of stakeholder engagement and planning instruments. The planning process needs to take into account social, economic or cultural consequences of adaptation measures. For example, relocation of communities threatens their cultural identity, as is the case for Pacific islanders or Inuit living in the Canadian Arctic. Economic conflicts arise when adaptation measures threaten local livelihoods; for example, discontinuing sand mining in Sao Tome and Principe would take away an important source of income for communities.

36. There is also a need to review the lessons learned from disaster risk reduction planning such as coastal zoning or flood planning and to assess whether such planning instruments are applicable for adaptation. Responses need to address the preferences of communities; examples from the Maldives have shown that natural coastal protection is preferred for islands with tourist resorts, whereas man-made structures such as sea dykes are preferred for islands that are inhabited by local people. Some participants noted that despite comprehensive planning, adaptation practices are not implemented owing to a lack of financial resources and stakeholder and private sector involvement.

4. Health

37. The discussion on adaptation planning and practices for the health sector was based on identified risks to human health, which include thermal extremes; extreme events such as droughts, floods and cyclones; degradation of water and food quality and quantity; vector-borne diseases; and the degradation of air quality leading to respiratory diseases.

38. Participants noted that adaptation planning for the health sector needs to be cross-sectoral, since measures in other sectors such as agriculture (e.g. increasing crop resilience or developing drought contingency plans) and water resources (e.g. increasing sanitation standards) have significant effects on health outcomes.

39. A number of good planning practices to integrate climate considerations into the health sector were explored. For example, at the international level, the Word Health Organization (WHO) is developing a strategy for adaptation to climate change and, in partnership with the United Nations Development Programme (UNDP) and the Global Environment Facility (GEF), is collaborating with seven countries to design and implement practical measures to protect health in a rapidly changing climate. To further enhance planning, an inter-agency network between WHO, the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) focuses on capacity-building, information exchange and the promotion of research on the links between climate change and health.

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[14] For example, participants highlighted that sand sea walls are more environmentally friendly than concrete walls as sand walls allow sea turtles to nest.

40. Participants noted three main adaptation practices in the health sector: reduction in exposure, prevention of disease onset and reduction in morbidity and mortality (these are termed primary, secondary and tertiary prevention in the health sector). These practices can be used by different actors to adapt to a number of health risks.

41. For example, faced with increasing numbers of extreme temperatures and weather events, communities can reduce their exposure by establishing and enforcing building and infrastructure standards. When faced with an extreme event, communities can reduce its impact by issuing early warnings and following emergency response plans to reduce casualties. For example, a timely warning by the Pacific ENSO Applications Center of a strong El Niño/Southern Oscillation event in 1997–1998 gave governments in the Pacific region sufficient time to react and hence reduce the subsequent incidence of diarrhoeal and vector-borne diseases.

42. With regard to water- and food-borne diseases, communities and all relevant national agencies need to develop and enforce watershed protection and safe water and food handling regulations, and to sponsor research and development of rapid diagnostic tools. Ghana is raising awareness through the use of posters that illustrate the relationships between climate change, food security, vectors and health.

43. The health sector faces many constraints on adaptation. Gaps and needs include insufficient understanding and recognition among health practitioners of the need to plan and implement adaptation in their sector; limited human and financial resources to address climate change related health risks in developing countries; and the overall lack of vulnerability and adaptation assessments for different health outcomes.

5. Cross-sectoral adaptation

44. Participants noted that adaptation requires a cross-sectoral approach as part of an overall sustainable development strategy. They highlighted the limitations of uncoordinated sectoral responses, which can be ineffective or even counterproductive since responses in one sector can increase the vulnerability of another sector or reduce the effectiveness of adaptation responses taken in the other sector. For example, measures to increase water availability through open water storage can lead to an increase in vector-borne disease.

45. Participants identified factors that facilitate coordination of adaptation planning across sectors, including potential entry points. Such factors include identifying regions or areas in which the interests of various sectors converge and identifying common stakeholders, including communities, ministries and agencies and the private sector. For example, India and the Maldives have established cross-sectoral national steering committees on climate change with representatives of key ministries, scientists and the private sector.

46. During adaptation planning, practitioners and researchers from the different sectors can meet to identify specific and cross-sectoral impacts of climate change and propose adaptation measures so that all have the same level of understanding. Such coordination meetings need to be institutionalized in order to establish an effective and sustained network of stakeholders from the different sectors. In order to develop integrated adaptation strategies, Ghana, using sectoral analyses, involved stakeholders from individual sectors during its adaptation planning process. Strategies and concrete projects were identified using a multi-sector framework and a multi-criteria analysis.

47. It is also important to have political commitment at a high level for cross-sectoral coordination to succeed. For example, in the United Kingdom responsibility for climate change rests at the ministerial level. In Mexico, coordination among sectors is now carried out by the Ministry of Finance and Public Credit under the leadership of the Office of the President; this has resulted in better coordination and collaboration.

48. Environmental and health impact assessments focusing on current climate variability were highlighted as potential entry points for integration and coordination. The Hyogo Framework for Action and associated national platforms for disaster risk reduction of the United Nations International Strategy for Disaster Reduction (ISDR) provide an opportunity for cross-sectoral collaboration on adaptation planning focusing, on the one hand, on relief in the aftermath of extreme events and climate-related disasters, and on planning for future disasters on the other. In addition, national programmes with supporting legislation and financial incentives provided by government can promote links between projects across sectors.

49. Despite progress in cross-sectoral cooperation and integration, barriers and constraints remain. Differences across sectors in mandates and interests, political and financial power and institutional culture inhibit collaboration among sectoral decision-makers. There is also a lack of political mandate, commitment and involvement of budget holders. Cooperation across sectors varies; for example, the water sector considers water needs for agriculture but pays less attention to health – concerns for quantity are more prominent than concerns for water quality. Institutional structures are often too formal, hindering the initiation of collaboration on adaptation. For example, cross-cutting economic activities such as tourism, which involve a wide range of sectors, may pose a challenge to fragmented decision-making in ministries.

C. Adaptation planning and practices at and across different levels

1. Subnational level

50. Adaptation planning and practices at the subnational level take place on provincial, municipal, urban and rural community scales. For adaptation to be successful at the subnational level, adaptation planning needs to address the local needs identified by communities by taking participatory approaches that complement any existing top-down efforts to implement national strategy and action plans.

51. Communities need to be adequately informed on how and why the climate is changing and should be enabled to assess whether their way of coping with current climate variability will be sufficient to deal with the impacts of climate change. The type of climate information and method of data transmission need to be tailored to local circumstances. For example, in India weather information is communicated to fishermen via short message service (SMS) on mobile phones or provided at fishermen's meeting points so that they are aware of the weather conditions at sea.

52. Besides training and raising the awareness of communities, participants emphasized that it is crucial to empower local government through capacity-building and training of local civil servants so that it can facilitate the planning for, and implementation of, community-based adaptation. NGOs, such as Practical Action, Oxfam and Christian Aid together with national research institutes and private service providers play an important role in this process.

53. Participants shared a number of adaptation practices used in rural communities. Examples include water harvesting in India and changing the species of poultry in Bangladesh; many others can be found in the UNFCCC database on local coping strategies.[15] However, less is known about the adaptive capacity and possible adaptation options of urban communities, which continue to grow rapidly, especially in developing countries.

54. Participants emphasized that good practices and examples developed at the subnational level need to be shared to enhance learning. Existing databases of adaptation practices and resources, including the UNFCCC database mentioned in paragraph 53 above and the Community Based Adaptation Exchange,[16] are helpful. However, since they are Internet-based and in English, not all

[15] <http://maindb.unfccc.int/public/adaptation>.
[16] <http://www.eldis.org/go/topics/dossiers/climate-change-adaptation/themes/cba-exchange>.

stakeholders at the subnational level can access them. Participants stressed that, for promoting local adaptation, there is a need to increase the information flow and intensify the sharing of experiences to learn new adaptation practices. The lack of extension services acting as bridges between research and farmers is a key barrier to people adopting new practices.

55. Traditional knowledge and practices, mostly the result of long-term adaptation to existing climatic conditions, have the potential to contribute to developing adaptation planning and practices. However, in some cases this knowledge is not appropriate in the changing conditions. There is a lack of systematic arrangements for documenting, assessing and disseminating traditional knowledge and local adaptation practices. Good practices include the work of the Commission for Agricultural Meteorology of WMO on the assessment of traditional practices used in semi-arid regions to cope with climate risk.

2. National level

56. Participants discussed how to facilitate the development of comprehensive adaptation planning and practices at the national level, noting that actions at this level can play an important role in the design of overarching policies and plans for the different sectors and provide input for coordination and integration of adaptation planning at regional and international levels.

57. Participants suggested that the involvement of all relevant ministries and agencies, sectoral stakeholders and the private sector is critical for defining, implementing and evaluating adaptation plans. Coordination on adaptation plans could be achieved through a high-level national adaptation planning committee similar to a national authority for carbon trading. The plans should clearly identify drivers of adaptation, including incentives, adaptation targets and indicators to allow for monitoring of progress on adaptation. Any adaptation planning should be based on a staged approach to adaptation that recognizes the temporal and spatial nature of climate change impacts and associated risks.

58. Participants emphasized that adaptation should be integrated into wider national policymaking processes and be weighed alongside other policy objectives and priorities. Planning and integration can be facilitated by making use of legislation such as national adaptation bills, policies such as spatial planning, and adaptation action plans or spending reviews, such as budget allocations for adaptation. Examples of national adaptation planning include the adaptation policy framework of the United Kingdom and national adaptation programmes of action (NAPAs) in least developed countries (LDCs).

59. As regards the identification of adaptation practices, participants agreed that adaptation practices need to be tailored to local and sectoral circumstances. They stressed that before implementing adaptation practices all stakeholders need to consider possible trade-offs between, or negative effects of, such practices. Even though some practices might be perceived currently as being ‘no regrets’ or ‘win-win’ they should be viewed as part of a long-term adaptation strategy.

60. Although some countries have advanced in their national adaptation planning and implementation, many gaps and obstacles remain in the majority of countries, which inhibit their ability to adapt successfully. Gaps identified by participants relate to a lack of knowledge and capacity, institutional and budgetary constraints and a lack of leadership and awareness among decisionmakers.

61. Regarding knowledge gaps, participants reported a limited understanding of the nature and extent of current and projected risks and vulnerabilities; limited understanding of the various adaptation practices, including their costs, benefits and possible trade-offs; loss of trained experts in developing countries to either the private sector or developed countries; and on how to integrate adaptation practices into other policies such as national development plans.

62. In terms of institutional constraints, participants noted insufficient coordination and cooperation on adaptation between government ministries and departments due to conflicting mandates, budgets and stakeholders; lack of supportive policies, standards and regulations; and existing legal or regulatory

restrictions. Regarding the lack of leadership and awareness among decisionmakers, participants emphasized the short-term nature of decision-making and planning horizons, which make planning and implementing adaptation unattractive. They also highlighted the low profile of adaptation in national policy discourse and the lack of public awareness.

3. Regional and international levels

63. Participants discussed how to coordinate and integrate adaptation planning and practices at the regional and international levels. They suggested that such coordination is necessary in the areas of awareness-raising, advocacy and funding to enhance efficiency and effectiveness of adaptation. However, it was also emphasized that coordination and integration at these levels should only be sought when it adds value to national or subnational adaptation activities.

64. Participants identified a number of existing regional networks and international organizations that are already engaged in adaptation or that could be used as a starting point to improve coordination and integration. Coordination and integration at a regional level can be improved through common networks, institutions or projects involving a wide range of governments, organizations or research institutes. For example, participants suggested that African governments could promote adaptation at a regional level through the African Ministers' Council on Water and the African Ministerial Conference on the Environment.[17]

65. Other regions have similar governmental networks, organized along economic, geographic or cultural lines. For example, in the EU, environmental protection agencies coordinate their adaptation work through a group under the EPA Network. Latin American countries, Spain and Portugal coordinate and cooperate on their adaptation activities through the Iberoamerican Programme of Evaluation of Impacts, Vulnerability and Adaptation to Climate Change (PIACC), which is part of the Iberoamerican Network for Climate Change Offices (RIOCC).

66. Coordination on adaptation at the international level can be promoted through institutions such as the United Nations Environment Management Group (EMG),[18] which brings together all United Nations agencies and secretariats of multilateral environmental agreements (MEAs) as well as the World Bank Group, the International Monetary Fund and the World Trade Organization to share information about their respective plans and activities in the areas of environment and human settlements, or the Joint Liaison Group of the three Rio Conventions (the UNFCCC, the United Nations Convention to Combat Desertification and the Convention on Biological Diversity (CBD)).

67. Cooperation can also be promoted through joint projects such as the Adaptation Learning Mechanism (ALM), which is implemented by UNDP in cooperation with a number of agencies and is financially supported by the GEF. The aim of the ALM is to share knowledge of and enhance learning on adaptation and to improve the integration of adaptation within development planning of agencies and countries.

68. Other regional and international networks and organizations that could promote the coordination of various aspects of adaptation deal with specific sectors or issues; for example, water resources (e.g. regional water basin authorities or water councils); coastal and marine resources (regional seas programmes); data, systematic observation and forecasting (e.g. global observing systems such as the Global Climate Observing System (GCOS)[19] and the Global Terrestrial Observing System,[20] the SERVIR[21] programme – a regional visualization and monitoring system for Central America – and

[17] <www.amcow.org> and <www.unep.org/roa/amcen>.
[18] <www.unemg.org>.
[19] <www.wmo.ch/pages/prog/gcos>.
[20] <www.fao.org/gtos>.
[21] <www.servir.net>.

regional Climate Outlook Forums); climate modelling and research (e.g. regional centres of excellence, consortia of universities and climate modelling centres); or disaster risk reduction (e.g. the Global and regional platforms of ISDR[22]).

69. Challenges, gaps and needs remain for coordinating adaptation at regional and international levels. Many challenges are due to differences in mandates and objectives between various agencies and institutions. For example, operational time scales vary from short-term to seasonal to multi-annual, making it difficult to synchronize activities. Furthermore, roles, responsibilities and incentives are not well defined, leading to duplications or areas being overlooked.

70. Participants stressed the need for regional and international organizations to support national governments in adaptation planning and practices. Regional organizations could set up targets, goals and indicators to monitor adaptation progress at the national level. Participants also identified a need to analyse existing initiatives and possible options for establishing a risk-sharing mechanism at a regional or international level as a form of adaptation.

71. To overcome some of the barriers, participants identified opportunities for enhancing coordination and integration. At the international level, for example, the implementation of mandates and decisions from different organizations and MEAs could be better coordinated. Participants expressed concern that having too many plans under the various MEAs inhibit implementation, and called for more streamlining. At the regional level, existing institutions and stakeholders need to be better understood to ensure that regional coordination is more focused and better assigned (clear schedules, process and responsibilities).

IV. Summary of recommendations

72. Participants recommended that general, cross-sectoral and sector- or level-specific activities be undertaken in order to address the gaps, needs, barriers, constraints and opportunities in adaptation planning and practices that have been identified.

73. With a view to promoting adaptation planning and practices at all levels and across all sectors, participants proposed the following general activities:

(a) **Undertake more targeted research** aimed at identifying and assessing practical adaptation options, including their costs, benefits and possible trade-offs;

(b) **Develop a conceptual framework for adaptation** that would assist in identifying the range of available adaptation practices while at the same time providing for flexibility and redesign of practices as more clarity emerges regarding the level of change or impacts to which different sectors and levels need to adapt;

(c) **Promote better communication between users and providers of data and information** so that research responds to the needs of stakeholders;

(d) **Develop a good-practice award scheme, a Web-based adaptation platform and a field-visit exchange programme** to raise awareness, showcase good practices on adaptation and gather good practice criteria;

(e) **Take stock of adaptation databases and share the results of the stocktaking** to raise awareness of sources of shared knowledge and validate so-called best practices;

[22] <www.preventionweb.net/globalplatform>.

(f) **Enhance the engagement of the private sector** in adaptation by promoting a business charter on adaptation, in which the private sector highlights good practices in integrating adaptation into their operations;

(g) **Enhance the integration of adaptation** into development and budgetary planning and policies across all sectors and at all levels.

A. Adaptation planning and practices in and across different sectors

74. Participants recommended the following activities in the agriculture and food security sector:

(a) **Actively diversify farming systems**, especially away from cash crops, with the support of micro-finance schemes such as microcredit based on sound natural resource management. The resulting systems would provide multiple agricultural products and income sources, and thus be more sustainable and resilient to climate change;

(b) **Strengthen agricultural extension services** so that knowledge and new adaptive farming practices can be faster and more effectively disseminated and incorporated;

(c) **Climate-proof rural development plans**;

(d) **Disseminate results from pilot adaptation projects on the ground** (such as those relating to crop diversification, micro-finance and crop insurance schemes) and comprehensive livelihood programmes in order to engage and sensitize stakeholders. Networks could be built to exchange knowledge and good practices, provide training, identify champions of adaptation in agriculture and engage decision makers.

75. For the water resources sector, participants recommended the following:

(a) **Rehabilitate deteriorating observational networks** and link weather databases, for example those provided by WMO, with hydrological monitoring;

(b) **Provide guidance on how to assess availability and accessibility of water resources** at the national and regional levels to determine the water carrying capacity, assess how it changes over time and identify possible thresholds in order to allow for adaptive water budgeting;

(c) **Assess water sector case studies**, highlighting successful integrated water resources management, particularly regarding their transferability and applicability;

(d) **Improve the understanding of competition for water** by monitoring the setting up and maintenance of water obstructions, assessing the carrying capacity of catchment basins and evaluating the effects of licensing for water usages;

(e) **Provide incentives for IWRM**, including through appropriate pricing of water resources (which incorporates social and environmental valuation);

76. For the coastal zone sector, participants recommended the following:

(a) **Promote policy review** to identify policies that could enhance adaptive capacity, including those aimed at removing barriers and stimulating risk sharing, for example through insurance;

(b) **Undertake practical research** to understand local contexts of adaptation, including underlying access to resources, adaptive capacity of coastal ecosystems, the process of decision-making and effects of adaptation measures;

(c) **Build capacity for wider application of ICZM** involving multiple levels, sectors and stakeholders;

(d) **Create enabling environments** by setting up legal frameworks for applying ICZM as part of sustainable development strategies and for empowering coastal communities to plan for and manage coastal resources.

77. For the health sector, participants recommended the following:

(a) **Carry out research and surveys** on climate change impacts and health outcomes, especially regarding the changing distribution of diseases, the identification of new risk areas and options to reduce health impacts, and subsequently disseminate the results widely to decision makers, health practitioners and communities;

(b) **Develop programmes and training to empower the health community** to plan and implement adaptation to climate variability and change, using existing centres of excellence and facilitating the development of new centres where needed;

(c) **Develop a general health strategy across agencies** for distribution through medical entities that includes a common portfolio with methods and tools, best practices aimed at climate proofing the health sector and risk management techniques;

(d) **Develop a campaign on climate change and health for children** through learning-oriented (e.g. school curricula) and creativity-oriented activities (e.g. competitions on campaign content).

78. To enhance cross-sectoral integration and collaboration, participants recommended the following:

(a) **Use existing or create new national adaptation platforms** to bring together sectoral stakeholders and experts for developing integrative adaptation strategies and plans;

(b) **Provide support for the development of legal and institutional frameworks** to enhance cross-sectoral collaboration on adaptation;

(c) **Develop a 'How to' document to provide guidance on integration** that includes integrated planning tools to assess possible trade-offs and case studies of projects with sectoral synergies;

(d) **Make use of regional organizations** and their meetings such as regional United Nations economic commissions to enhance cross-sectoral collaboration on adaptation through awareness-raising, information exchange and common projects.

B. Adaptation planning and practices at and across different levels

79. Participants recommended the following activities at the subnational level:

(a) **Endorse and recognize the importance of engaging subnational actors** in the UNFCCC negotiating process on adaptation and/or the mandates arising therefrom;

(b) **Ensure community (i.e. end user) involvement in framing research** to ensure rapid and effective assimilation of research results;

(c) **Apply information at the local level** in a format that can be used and understood locally, for example, through user-friendly climate change casebooks that highlight issues such as sustainability, transferability and scalability of adaptation practices;

(d) **Analyse and enhance urban adaptation** by supporting organizational learning processes and establishing quality standards for urban management.

80. At the national level, participants recommended the following:

(a) **Facilitate the development of national regulatory frameworks for adaptation**, national adaptation strategies and corresponding adaptation action plans, including by preparing a handbook or set of guidelines with case examples;

(b) **Invite all countries to identify national focal points for adaptation** and hold regular meetings of those focal points to exchange ideas and experiences;

(c) **Expand the NAPA process** to non-LDC countries;

(d) **Develop a country-driven, indicator-based monitoring and evaluation system for adaptation** in different sectors and levels to identify good practices and maladaptation.

81. At the regional and international levels, participants recommended the following:

(a) **Map and take stock of regional and international institutions, networks and projects** to facilitate awareness and coordination of adaptation actions, enhance synergies and ensure that needs are fulfilled;

(b) **Strengthen regional hubs** and networks for knowledge exchange and capacity-building with a view to supporting adaptation at the national level;

(c) **Facilitate access to data and tools** including climate models and their outputs by linking geospatial data/modelling portals, including those of FAO, WMO (regional climate centres and Climate Outlook Forums), the Met Office Hadley Centre of the United Kingdom (PRECIS (Providing REgional Climates for Impacts Studies) work) and the Data Distribution Centre of the Intergovernmental Panel on Climate Change;

(d) **Prepare a special report on adaptation** summarizing practical experiences for wide dissemination;

(e) **Facilitate regional adaptation projects and activities** through regional institutions and networks to address climate change impacts on shared regional resources such as watershed basins, biodiversity or coastal ecosystems;

(f) **Enhance coordination of adaptation at the international level** through coordinated mandates and activities of different MEAs, for example using the Joint Liaison Group, and organizations, for example using the EMG.

V. Issues for follow-up and further consideration

A. Suggestions for additional activities

82. Participants discussed ways to implement the recommendations from the workshop and possible additional activities to be undertaken under the Nairobi work programme. Representatives from organizations and the three UNFCCC expert groups described how their organizations and groups could address some of the gaps and needs and take some of the recommendations forward in the areas of capacity-building and awareness-raising, addressing information needs and promoting adaptation planning and practices.

83. In the areas of capacity-building and addressing information needs, the Chair of the CGE outlined how the group will contribute to the Nairobi work programme through technical advice and

support on tools and methodologies for adaptation assessments. The Center for Environment and Development for the Arab Region and Europe will undertake capacity-building in 22 Arab and North African countries, especially in the area of adaptation in water management, and proposed to share the decision support system it has developed for the Nile Basin Initiative. ISDR proposed to build on the Drought Risk Reduction Network to strengthen early warning. It also pledged to incorporate adaptation in its ISDR system education campaign (2006–2007) and the upcoming campaign on health (2008–2009). The Stockholm Environment Institute expressed its strong support for the Nairobi work programme and pledged to set up an adaptation network called 'Adapt Now Africa First' and to provide capacity-building through tools, publications and a 'wiki' collaborative website on adaptation.

84. The UNESCO–IHE Institute for Water Education emphasized its support for enabling regional partners to develop the capacity to deal with adaptation, in particular in the water sector. WHO will contribute by providing methods, tools and socio-economic information with estimations of the burden of disease. It also agreed to promote the Nairobi work programme by including its objectives in the biannual work plans of the organization. WMO outlined how the World Climate Programme and its Climate Outlook Forums, the Hydrology and Water Resources Programme and GCOS address information needs for adaptation. In addition, the World Climate Research Programme is contributing through climate modelling scenarios and downscaling as well as assessing the adequacy of existing tools. The Global Change System for Analysis, Research and Training (START) committed to enhance capacity-building, including through training mid-career professionals, through various programmes in Africa and South East Asia.

85. In the area of adaptation planning, the Chair of the LEG highlighted the group's willingness to support non-LDCs in developing national adaptation plans. The Co-operative Programme on Water and Climate pledged to support adaptation planning in the water sector by providing tools and methodologies and raising awareness on adaptation at high-level events such as the fifth World Water Forum (taking place in March, 2009 in Istanbul, Turkey). The International Council of Local Environmental Initiatives agreed to share its experiences, including in the adaptation strategy of London, and undertake pilot programmes in adaptation planning for urban areas.

86. In the area of adaptation practices, the representative from the EGTT pledged the group's willingness to provide an interface between planning and implementation through guidance on sources of funding and support for pilot projects in the area of the development and transfer of environmentally sound technologies for adaptation. The Munich Climate Insurance Initiative pledged to conduct a pilot study to facilitate insurance in developing countries whereby risk management practices will enhance rather than compete with adaptation activities. Practical Action committed to developing a model and approach for community-based adaptation as well as to testing and scaling up technologies at a local level and to sharing experiences gained through the Nairobi work programme.

87. The Institute for Environment and Human Security of the United Nations University stated that the Nairobi work programme has been incorporated in its work on adaptation relating to human security. Work includes 15 case studies on the role of reinsurance and funding for adaptation. Besides analysing the costs of climate impacts and adaptation measures, the World Bank noted that it is incorporating adaptation into large lending programmes and exploring new financial instruments to support adaptation practices such as micro-scale insurance mechanisms or devising adaptation bonds to tap financial markets. FAO intends to continue to enhance its adaptation activities by adapting agrometeorological tools, crop yield modelling and pest- and drought-observing systems.

88. In the area of coordination and integration across levels and sectors, ISDR proposed to make use of its Joint Work Programme of the ISDR-system to coordinate action on adaptation measures that relate to disaster risk reduction. The Organisation for Economic Co-operation and Development highlighted its work on preparing guidelines for integrating adaptation into official development assistance. UNEP highlighted its work on mainstreaming adaptation in its activities through regional centres and its work

on disaster risk reduction. The World Tourism Organization pledged to develop guidelines for the integration of adaptation into the tourism sector, share good practices and support the inclusion of tourism in adaptation assessment and planning. The International Waters Learning Exchange and Resource Network (IW:Learn) highlighted its lessons learned in transboundary water management, especially with regard to the institutional setup of inter-ministerial committees.

89. The CBD stated that it is increasingly integrating adaptation into biodiversity programmes. FAO highlighted that its adaptation strategy is largely designed around the Nairobi work programme and emphasizes food security and sustainable management of natural resources for agriculture, forestry and fisheries production. In June 2008 FAO will hold a high–level meeting on world food security and the challenges of climate change and bioenergy. An outcome from the meeting is expected to be a stronger international consensus on actions needed to address climate change issues in agriculture, forestry and fisheries.

B. Next steps under the Nairobi work programme on impacts, vulnerability and adaptation to climate change

90. The recommended general, cross-sectoral and sector- or level-specific activities could be undertaken by Parties, relevant organizations and other stakeholders engaged under the Nairobi work programme to address the identified gaps, needs, barriers and constraints and to take advantage of opportunities with regard to adaptation planning and practices. These recommendations could also serve as input into the general consideration by the SBSTA of outputs and of further activities under the Nairobi work programme.

91. To complement the recommendations, the secretariat will develop, under the guidance of the Chair of the SBSTA, 'Call for Action' sheets, taking into account discussions at the workshop, the questionnaire distributed to workshop participants and submissions from Parties and organizations.[23] These calls for action may facilitate the implementation of key activities by relevant organizations and other stakeholders engaged under the Nairobi work programme, with a view to achieving the objective and expected outcomes of the Nairobi work programme and enhancing adaptation planning and practices at all levels and across all sectors.

92. Participants also agreed to further consider and elaborate on identified recommendations which relate to other areas of work of the Nairobi work programme, including methods and tools, data and observation, climate modelling, scenarios and downscaling, socio-economic information and research, at subsequent workshops and expert meetings.

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[23] 'Call for Action' sheets and responding action pledges will be posted at <http://unfccc.int/3633.php>.