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**Subsidiary Body for Scientific and Technological Advice**

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Item 3 of the provisional agenda

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

**Synthesis report on methods and tools for, and good practices and lessons learned relating to, adaptation planning processes addressing ecosystems, human settlements, water resources and health, and good practices and lessons learned related to processes and structures for linking national and local adaptation planning**

**Note by the secretariat\***

*Summary*

This document synthesizes information contained in submissions from Parties and Nairobi Work Programme partner organizations on: (a) available and implemented tools and methods for adaptation planning processes addressing the four issues of ecosystems, human settlements, water resources and health; (b) good practices and lessons learned in relation to adaptation planning processes, including on monitoring and evaluation, addressing the four issues mentioned above; and (c) good practices and lessons learned related to processes and structures for linking national and local adaptation planning. The report concludes with a brief summary of the main elements common to the submissions.

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\* This document was submitted after the due date owing to the date of the submission of views.

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## **I. Introduction**

### **A. Mandate**

1. The Subsidiary Body for Scientific and Technological Advice (SBSTA), in its conclusions from SBSTA 40 on the Nairobi work programme on impacts, vulnerability and adaptation to climate change (NWP), requested the secretariat to prepare, by SBSTA 41, a synthesis report based on information submitted by Parties and NWP partner organizations, including regional centres and networks, on:<sup>1</sup>

(a) Available and implemented tools and methods for adaptation planning processes addressing the four issues of ecosystems, human settlements, water resources and health;

(b) Good practices and lessons learned in relation to adaptation planning processes, including on monitoring and evaluation, addressing the four issues mentioned above;

(c) Good practices and lessons learned, related to processes and structures for linking national and local adaptation planning.

### **B. Scope of the note**

2. This document provides a synthesis of two submissions from Parties (Italy and the European Commission on behalf of the European Union (EU) and its member States; and Mexico) and 18 submissions from NWP partner organizations.<sup>2</sup> Chapters II to IV below cover the topics listed in paragraph 1(a–c) above. The final chapter provides a summary of the key elements identified across the submissions.

### **C. Background**

3. The Conference of the Parties (COP), at its nineteenth session, decided to continue the NWP within the framework of the provisions of decision 2/CP.11, addressing the knowledge needs arising from, inter alia, the Cancun Adaptation Framework and other relevant workstreams and bodies under the Convention and the knowledge needs identified by Parties.<sup>3</sup> The COP also requested the SBSTA to consider, under the NWP, the issues of ecosystems, human settlements, water resources, and health.<sup>4</sup>

4. In accordance with decision 17/CP.19, SBSTA 40 agreed on a set of activities to be undertaken under the NWP, by 2015, so that information and knowledge may be collected, analysed and disseminated to inform adaptation planning and actions at the regional, national and subnational levels, particularly in relation to, inter alia, ecosystems, human

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<sup>1</sup> FCCC/SBSTA/2014/2, paragraphs 20 and 21.

<sup>2</sup> The submissions from Parties are available at <<http://www4.unfccc.int/submissions/SitePages/sessions.aspx>>. The submissions from the NWP partner organizations are available at <<http://unfccc.int/7482>>.

<sup>3</sup> Decision 17/CP.19, paragraph 1.

<sup>4</sup> Decision 17/CP.19, paragraph 5.

settlements, water resources and health.<sup>5</sup> This synthesis report is the first result of this set of activities.

## **II. Methods and tools for adaptation planning processes addressing ecosystems, human settlement, water resources and health**

### **A. Introduction**

5. A wide range of methods and tools have been developed by Parties and NWP partner organizations, including comprehensive risk management and adaptation decision-making frameworks, sectoral and integrated assessment models, knowledge platforms, and guidance documents and tools (see the annex for examples of methods and tools for adaptation planning processes under each of the four issues).

6. Methods and tools developed and implemented by countries and NWP partner organizations for adaptation planning processes are mainly available and implemented for:

- (a) Assessing current and future vulnerability;
- (b) Planning, identifying and appraising options for adaptation.

### **B. Available and implemented methods and tools for assessment**

7. The submissions covered by this document include a wide range of examples on developing and disseminating methods and tools; providing data and scenarios; and assessing impacts and vulnerability to determine whether and to what extent climate change will impact ecosystems, human settlements, water resources and health.

8. Examples that are not specific to one issue include the work of the Food and Agriculture Organization of the United Nations (FAO) related to the collection, analysis and assessment of the existing data on health, human settlements,<sup>6</sup> water resources and ecosystems, undertaken mostly through a thorough gap analysis and identification of the interlinkages among water quality, food safety and agriculture depending on available data at the country level.

#### **1. Addressing ecosystems**

9. For ecosystems, linking top-down (i.e. downscaling broad climatic and development parameters to local conditions) and bottom-up approaches (i.e. addressing inherent system vulnerabilities and opportunities) in assessing risk is especially critical, particularly because many ecological impacts are difficult to predict even when climate impacts are already well known and described.

10. There are different approaches to vulnerability assessments, ranging from narrative approaches (Conservation International's vulnerability assessment of the Discovery Coast and Abrolhos Shelf region – Brazil)<sup>7</sup> to index- and geographic information system based

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<sup>5</sup> FCCC/SBSTA/2014/2, paragraph 19.

<sup>6</sup> The term "human settlements" is defined as, and understood to comprise, shelter and related facilities and services that affect habitability and efficiency from the viewpoints of the quality of life and economic and social opportunity (UN-Habitat document HSP/GC/21/5/Add.3).

<sup>7</sup> Available at <[http://www.conservation.org/publications/Documents/CI\\_Ecosystem-based-Adaptation-Vulnerability-Assessment-Brazil.pdf](http://www.conservation.org/publications/Documents/CI_Ecosystem-based-Adaptation-Vulnerability-Assessment-Brazil.pdf)>.

approaches (Conservation South Africa's vulnerability assessment for Namaqualand (South Africa)<sup>8</sup>). They can be undertaken at different scales, from regional to national or local, depending on the desired level of information. Recommendations resulting from Conservation International's vulnerability assessments in the Philippines were adopted by the Ministry of Climate Change, while for Ecuador they were integrated into the national adaptation plan.

11. Tools for assessing climate vulnerability associated with ecosystems include the environmental flows assessment, which is useful for estimating the environmental flow needed to sustain important ecosystem functions essential to increasing the adaptive capacity of the biosphere; the strategic environmental assessment, which includes an evaluation of climate risk exposure and sensitivity; and risk assessment – an important tool for assessing climate vulnerabilities and appropriate response strategies. Another example of a practitioner tool developed by the Cooperative for Assistance and Relief Everywhere (CARE) is the *Climate Vulnerability and Capacity Analysis Handbook*,<sup>9</sup> which provides key insights into the climatic, environmental, social, economic and political factors that determine people's vulnerability to climate change at the local level. Of late, climate vulnerability and capacity analysis has also been adapted for more specific contexts, for example a strengthened integration of ecosystem considerations in CARE projects in Ethiopia.

## 2. Addressing human settlements

12. Many climate-sensitive infrastructures, including in cities, such as those for transport, power distribution, water supply, sewage, and buildings, need to be assessed for resilience to current and future risks due to climate change, and upgraded accordingly. Various organizations in Europe have developed related vulnerability and risk assessments.<sup>10</sup>

13. Many different methods and tools have been developed and employed for the provision of data and information on understanding climate-induced vulnerability and risk to human settlements. The Norwegian Refugee Council and its Internal Displacement Monitoring Centre (IDMC), for example, have produced global and regional analyses of existing patterns of displacement associated with climate-related hazards. The Institute for Social and Environmental Transition–International (ISET) employs a unique approach to investigating hazards, vulnerabilities and frequencies, which relates future climatic events and the associated return periods to risk reduction features, and has guided research work on the economic returns of climate resilience development pathways.

## 3. Addressing water resources

14. Submissions include examples of decision support frameworks and tools for the provision of data and information on climate-induced vulnerability and risk to water resources.

15. Examples of decision support framework tools include a decision support system designed by the Alliance for Global Water Adaptation,<sup>11</sup> which makes use of existing tools, research, and data products to develop an evidence-based system for informing water management decision-making processes, and the Strategic Framework for Water Security

<sup>8</sup> Available at <<https://static.weadapt.org/knowledge-base/files/1230/51c4c23ad02f8final-vulnerability-assessment-full-technical-report-ndm-with-cover.pdf>>.

<sup>9</sup> Available at <[http://issuu.com/careandclimatechange/docs/care\\_cvcahandbook](http://issuu.com/careandclimatechange/docs/care_cvcahandbook)>.

<sup>10</sup> See <<http://climate-adapt.eea.europa.eu/cities>>.

<sup>11</sup> See <<http://alliance4water.org/About/DSS/index.html>>.

and Climate Resilient Development of the African Ministers' Council on Water,<sup>12</sup> currently being implemented in Africa on a pilot basis so as to facilitate the involvement of all sectors, particularly government institutions less often in prime climate focus, such as ministries of finance, and institutions responsible for infrastructure development and management.

16. The Aqueduct platform of the World Resources Institute (WRI), on the other hand, serves as a tool for the provision of data and information. The platform shows countries' and river basins' average exposure to five water risk indicators: baseline water stress, inter-annual variability, seasonal variability, flood occurrence, and drought severity, and can help to analyse climate vulnerabilities and risks and identify areas of uncertainty that need to be factored into national adaptation plans.<sup>13</sup>

#### 4. Addressing health

17. Examples of frameworks and tools for providing data and scenarios have been provided in the submissions. This includes the Global Framework for Climate Services adaptation programme in Africa, a collaborative initiative of the World Meteorological Organization (WMO), the World Health Organization (WHO) and other partners, which focuses on how health actors in Malawi and Tanzania can better use climate information to inform health planning, research, and public health responses to climate-related health risks, such as cholera, malaria, malnutrition, and natural disasters. This international initiative seeks to improve and expand climate and weather services such as seasonal forecasts and drought monitors, and support their uptake by key sectors such as health, food security, water, and disaster risk reduction. Another example is the *Resource Guide for Advanced Learning on Understanding the Climate Change and Health Interface*, developed by the UN CC:Learn secretariat.<sup>14</sup>

18. With regard to vulnerability assessment, WHO has developed a guidance document on conducting national or subnational assessments of current and future vulnerability (i.e. the susceptibility of a population or region) to the health risks of climate change, and of policies and programmes that could increase resilience, taking into account the multiple determinants of climate-sensitive health outcomes.<sup>15</sup>

### C. Available methods and tools for planning

19. The EU has provided in-depth information on the progress on national adaptation strategy development. Seventeen EU member States have adopted a national adaptation strategy.<sup>16</sup> Some of these countries also have action plans in place, while others are in the process of developing strategies and/or action plans. Most have undertaken risk or vulnerability assessments as a basis for adaptation policy development, predominantly on the national scale; some countries have conducted assessments at the subnational, transnational and sectoral levels. Certain overarching aspects of good adaptation planning have been highlighted in the EU submission, in particular:

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<sup>12</sup> See <<http://cdkn.org/project/cdkn-supports-implementation-of-the-africa-water-climate-and-development-programme>>.

<sup>13</sup> See <<http://www.wri.org/our-work/project/aqueduct>>.

<sup>14</sup> Available at

<[http://unclearn.org/sites/www.unclearn.org/files/images/resource\\_guide\\_on\\_understanding\\_the\\_cc\\_and\\_health\\_interface.pdf](http://unclearn.org/sites/www.unclearn.org/files/images/resource_guide_on_understanding_the_cc_and_health_interface.pdf)>.

<sup>15</sup> Available at <<http://www.who.int/globalchange/resources/adaptationresources/>>.

<sup>16</sup> See <<http://climate-adapt.eea.europa.eu/countries>>.

(a) Integrating adaptation into existing national programmes and policies is central to all present adaptation strategies;

(b) All adaptation strategies, or their related action plans, have combined the need for cross-government working groups to drive implementation; the groups should have strong linkages to key sectors;

(c) Varying approaches have been adopted with regard to stakeholder involvement in the process of development of existing adaptation strategies, from centralized to relatively decentralized. Centralized approaches have involved a small core group of administrations only, while decentralized approaches have engaged a wide range of state and non-state stakeholders;

(d) All member States acknowledge that, without effective communication, capacity-building and awareness-raising, implementation of the adaptation strategy and associated actions will be very challenging;

(e) All adaptation strategies appear to be intended as evolving documents that will be reviewed. Revision of adaptation strategies should be aligned with advancing climate change science, research and technology and enhanced capacity;

(f) Some transnational regions within Europe, for example the Danube River basin,<sup>17</sup> the Baltic Sea region,<sup>18</sup> and the Pyrenees,<sup>19</sup> have developed adaptation strategies. Furthermore, many transnational projects on climate change adaptation have been funded by the EU.<sup>20</sup>

20. In Mexico, the Special Climate Change Programme 2014–2018 places more emphasis on adaptation as a responsibility shared by all 13 ministries of the Mexican Government, recognizing the importance of social and institutional capacity-building and of ecosystem-based adaptation as strategies to reduce vulnerability. This programme's mechanism of compliance is based on a series of strategies and actions, to be evaluated using an indicator system.

21. At present, there are few structured processes through which communities can talk to scientists and policymakers about climate change adaptation. Adaptation Learning Highways, a process led by the International Centre for Integrated Mountain Development (ICIMOD) is an example of a strategic process that fosters information and knowledge exchange among communities, scientists and policymakers with the goal of informing the decision-making process and making it more inclusive. By recognizing autonomous community adaptation as a basis for planned adaptation, this initiative seeks to make planned adaptation more effective, targeted, and responsive to community needs. ISET, on the other hand, has developed methodologies for multi-stakeholder assessment and planning that engage stakeholders as active participants and leaders in designing, managing, and carrying out the key aspects of the Shared Learning Dialogues project.<sup>21</sup>

22. Some submissions have also provided examples of frameworks that facilitate decision-making on adaptation. WRI's National Adaptive Capacity framework<sup>22</sup> helps to assess and analyse the strengths and weaknesses of institutions involved in adaptation planning and to identify capacity gaps within institutions so that those involved in

<sup>17</sup> See <<http://www.icpdr.org/main/climate-adaptation-strategy-adopted>>.

<sup>18</sup> See <<http://www.balticsea-region-strategy.eu/communication/news/590661-the-eusbsr-action-plan-translated-into-the-languages-of-the-region>>.

<sup>19</sup> See <<http://www.opcc-ctp.org/en/actions/climate>> (in French and Spanish).

<sup>20</sup> See <<http://climate-adapt.eea.europa.eu/transnational-regions>>.

<sup>21</sup> See <<http://i-s-e-t.org/resources/working-papers/climate-resilience-paper-1.html>>.

<sup>22</sup> See <<http://www.wri.org/publication/ready-or-not>>.

adaptation planning processes can assess how institutions may or may not need to adjust to incorporate and support adaptation planning and build institutional capacity.

23. Workshops also serve as a useful tool to support the national adaptation planning process. The technical workshops in Ghana, Jamaica and Tanzania, hosted by the national governments and regional institutions and managed by the International Resources Group in collaboration with USAID, facilitated discussions on methods to support the development and implementation of national adaptation plans. Participants in the workshop identified and prioritized their development goals, identified ways that climate change and other threats can affect these goals, and identified and prioritized critical actions and institutional roles necessary to respond to these threats and achieve their country's development vision.

## 1. Addressing ecosystems

24. The EU submission includes discussion of ecosystem consideration in adaptation planning. In 2012, the EU adopted the EU biodiversity strategy to 2020,<sup>23</sup> which set out a long-term (2050) EU vision on biodiversity policy and agreed a range of mid-term (2020) targets and actions, addressing climate change among other issues. The main EU policy instruments for the long-term protection of biodiversity are the habitats and the birds directives and the Natura 2000 network.<sup>24</sup> Green infrastructure<sup>25</sup> could improve the resilience of ecological networks to climate change.<sup>26</sup> In addition, a range of cities have developed climate change adaptation strategies and action plans, supported by various initiatives, including the Mayors Adapt project.<sup>27</sup>

25. With regard to tools for appraisal of adaptation options, CARE's Adaptation Learning Programme for Africa, in partnership with the New Economics Foundation, has developed a methodology for the social and economic analysis of community-based adaptation. The tool offers a simplified evaluative framework and focuses primarily on climate change adaptation interventions, but could also be used for appraising and evaluating development projects more broadly (e.g. health interventions, education programs and others).

26. WRI has worked with a broad partnership to develop a guidebook for economic valuation practitioners – both economists and non-economists – who would like to conduct coastal ecosystem valuation to achieve influence and inform real-world decisions.<sup>28</sup> This guidebook is based on the economic valuation studies of coral reefs and mangroves conducted at national and subnational levels in five countries: Belize, the Dominican Republic, Jamaica, St. Lucia, and Trinidad and Tobago. WRI also employs participatory scenario development with a wide range of stakeholders to develop adaptation options and assess trade-offs between options and scenarios, and to identify options in the face of

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<sup>23</sup> See <<http://ec.europa.eu/environment/nature/biodiversity/comm2006/2020.htm>>.

<sup>24</sup> See <[http://ec.europa.eu/environment/nature/natura2000/index\\_en.htm](http://ec.europa.eu/environment/nature/natura2000/index_en.htm)>.

<sup>25</sup> See <[http://ec.europa.eu/environment/nature/ecosystems/docs/green\\_infrastructures/1\\_EN\\_ACT\\_part1\\_v5.pdf](http://ec.europa.eu/environment/nature/ecosystems/docs/green_infrastructures/1_EN_ACT_part1_v5.pdf)>.

<sup>26</sup> Relevant further information is available from the European Commission at <[http://ec.europa.eu/environment/nature/knowledge/index\\_en.htm](http://ec.europa.eu/environment/nature/knowledge/index_en.htm)>, from the Biodiversity Information System for Europe at <[http://biodiversity.europa.eu/countries/eu\\_country\\_profiles](http://biodiversity.europa.eu/countries/eu_country_profiles)> and from the European Climate Adaptation Platform at <<http://adapt-test.eea.europa.eu/web/guest/biodiversity>>.

<sup>27</sup> See <<http://mayors-adapt.eu/>>.

<sup>28</sup> *Coastal Capital: Ecosystem Valuation for Decision Making in the Caribbean*. Available at <<http://www.wri.org/publication/coastal-capital-guidebook>>.



climate uncertainty and plausible futures when there is uncertainty regarding the levels of thermal stress that may affect the coastal ecosystem.<sup>29</sup>

27. CARE International, the World Wide Fund for Nature and the International Union for Conservation of Nature have jointly developed a framework for the integration of ecosystem- and community-based approaches to adaptation that empowers local communities to manage ecosystems under resilient governance arrangements that can provide ecosystem services on which they depend.<sup>30</sup> ICIMOD, meanwhile, is implementing an ecosystem-based adaptation project in the four basins of the Hindu Kush Himalayas to improve understanding of the impact of climate change and associated changes in ecosystems. This will enable research institutions, governments and civil society organizations to develop interventions that can enhance ecosystem resilience.

## 2. Addressing human settlements

28. The submissions include examples of guidance documents for adaptation planning addressing human settlements and human mobility issues. The United Nations University and the Nansen Initiative, in collaboration with the International Organization for Migration (IOM) and the United Nations High Commissioner for Refugees (UNHCR) and a number of other organizations, developed a policy brief on integrating human mobility issues into national adaptation plans.<sup>31</sup>

29. With regard to tools for identifying and appraising adaptation options, IDMC has developed a probability model that estimates the likelihood of future displacement. The model is based on the scale of displacement related to reported disasters. This research and modelling includes a decision support tool that simulates real time impacts of climate hazards, demographic trends and different policies and interventions on pastoralist livelihoods and displacement, and can be used to evaluate the effectiveness of different adaptation strategies under different climate scenarios. The Framework for Assessing, Monitoring and Evaluating the Environment in Refugee-related Operations, developed by UNHCR and CARE International, is another example of such a tool.<sup>32</sup> It has been tested with partners in post-conflict and post-disaster situations, primarily in Africa and Asia, and has produced tools and guidelines that help managers and field practitioners address environmental issues and concerns, from contingency planning to potential responses to situations where camps are closed and rehabilitated.

30. A wide range of approaches to integrating adaptation and development planning have been shared in the submissions. For example, IOM is working closely with its member States to advocate for the inclusion of human mobility issues in adaptation planning, and is supporting them with technical expertise so they can include these questions in national policy development. IOM collaborated with the Government of the Federated States of Micronesia to design a new integrated policy that refers to human mobility, climate change, disaster risk reduction and sustainable development. IDMC has also undertaken research work on how human mobility has been addressed within existing national adaptation programmes of action (NAPAs), national adaptation plans and other related laws and policy instruments in the Pacific. This led to developing recommendations for Parties on how they can increase the effectiveness of adaptation strategies with respect to preventing and responding to climate change induced displacement.

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<sup>29</sup> See <<http://www.wri.org/our-work/project/coastal-capital-economic-valuation-coastal-ecosystems-caribbean>>.

<sup>30</sup> See <[http://www.careclimatechange.org/files/adaptation/ELAN\\_IntegratedApproach\\_150412.pdf](http://www.careclimatechange.org/files/adaptation/ELAN_IntegratedApproach_150412.pdf)>.

<sup>31</sup> Available at <<http://ehs.unu.edu/file/get/11800.pdf>>.

<sup>32</sup> See <<http://www.unhcr.org/4a97d1039.html>>.

31. In relation to strengthening the capacity of policymakers and practitioners, IOM has developed a comprehensive training curriculum on migration, environment and climate change for policymakers and practitioners across different areas: migration, climate, adaptation and disaster risk reduction. To date, training sessions have been held in East Africa, Asia Pacific and Latin America.

### 3. Addressing water resources

32. Countries in the EU have developed several kinds of policy instruments to address both flood- and drought-related issues. The main water-related EU policy instrument that encompasses climate adaptation is the water framework directive.<sup>33</sup> Climate change is also to be addressed in the implementation of the floods directive,<sup>34</sup> which requires member States to establish flood risk management plans focused on prevention, protection and preparedness by 2015, and to take into account climate change. The EU also has policies in place addressing water scarcity and drought.<sup>35</sup>

33. Partner organizations have developed various toolkits to facilitate adaptation planning in the context of water resources. WMO and the Global Water Partnership (GWP) have developed the Integrated Drought Management Programme, which supports stakeholders at all levels by providing policy and management guidance, and by sharing scientific information, knowledge and best practices for integrated drought management. Another joint initiative of these two organizations, the Associated Programme on Flood Management, facilitates dialogue among governmental agencies and provides guidance on flood management policy, strategy and institutional development. GWP has also developed an information exchange platform for water management practitioners and professionals to discuss and analyse the various elements of the Integrated Water Resources Management process and for help with the prioritization of actions aimed at improving water governance and management.<sup>36</sup> Furthermore, GWP is developing a water supplement to the technical guidelines for the national adaptation plan process,<sup>37</sup> developed by the Least Developed Countries Expert Group, in order to advance knowledge on water-related adaptation.

34. A tool mentioned by CARE involves participatory planning for watershed management through consensus-building and through developing a long-term vision for sustainable natural resource management and adaptation strategies.

35. WRI's Natural Infrastructure for Water project is dedicated to scaling up smart, cost-effective solutions for securing water resources. The programme will leverage WRI's geospatial mapping and economic expertise to identify water risks, unveil natural infrastructure opportunities, and inform smart strategies for securing water resources.<sup>38</sup>

### 4. Addressing health

36. Climate change is addressed within the EU health policy framework.<sup>39</sup> The European environment and epidemiology network and portal<sup>40</sup> of the European Centre for

<sup>33</sup> See <[http://ec.europa.eu/environment/water/water-framework/index\\_en.html](http://ec.europa.eu/environment/water/water-framework/index_en.html)>.

<sup>34</sup> See <[http://ec.europa.eu/environment/water/flood\\_risk/index.htm](http://ec.europa.eu/environment/water/flood_risk/index.htm)>.

<sup>35</sup> See <[http://ec.europa.eu/environment/water/quantity/scarcity\\_en.htm](http://ec.europa.eu/environment/water/quantity/scarcity_en.htm)>.

<sup>36</sup> Information on other knowledge platforms and tools developed by GWP is available at <<http://gwpsea-toolbox.net/>>, <<http://www.cehi.org/lc/Rain/Rainwater%20Harvesting%20Toolbox/index.htm>>, <<http://www.gwp.org/en/Caribbean-Water-and-Climate-Knowledge-Platform/>> and <[http://www.apfm.info/?page\\_id=1253](http://www.apfm.info/?page_id=1253)>.

<sup>37</sup> See <[http://unfccc.int/files/adaptation/cancun\\_adaptation\\_framework/application/pdf/naptechguidelines\\_eng\\_high\\_res.pdf](http://unfccc.int/files/adaptation/cancun_adaptation_framework/application/pdf/naptechguidelines_eng_high_res.pdf)>.

<sup>38</sup> See <<http://www.wri.org/our-work/project/natural-infrastructure-water>>.

<sup>39</sup> See <[http://ec.europa.eu/health/climate\\_change/policy/index\\_en.htm](http://ec.europa.eu/health/climate_change/policy/index_en.htm)>.

Disease Prevention and Control provides guidance on the surveillance of infectious diseases, a handbook for assessments on communicable diseases, infectious disease risk maps and risk assessment related to food-, water- and vector-borne diseases.<sup>41</sup>

37. The economic valuation tool developed by WHO can help analyse health damage costs associated with the 'business as usual' scenario (i.e. no adaptation) under climate change, the costs of undertaking the necessary measures to minimize or prevent health damage caused by climate change, and summary indicators of the economic performance of adaptation measures in terms of either cost-effectiveness or economic benefits versus costs.<sup>42</sup>

### III. Good practices and lessons learned, related to adaptation planning processes, including monitoring and evaluation, addressing the four issues of ecosystems, human settlements, water resources and health

38. Some good practices and key lessons have emerged from the experience of countries and NWP partner organizations with developing and implementing a wide array of approaches to national adaptation planning processes addressing the four issues of ecosystems, human settlements, water resources and health.

39. One of the key lessons learned concerns **the need to develop an integrated approach to climate change response and development and to integrate adaptation planning and practices across sectors**. Given the global nature of climate change and the need to unite fragmented development efforts, an integrated approach to climate change response and development is critical. Climate change will increase the intensity and possibly frequency of extreme climate events. Development which occurs in disaster-prone areas, such as flood plains, coasts, or mountainsides is going to be extremely vulnerable to a changing climate. Addressing climate change will require not only adapting to future climate regimes, but integrating planning, development and management processes so they account for these risks better. Inherent to this is the harmonization of adaptation planning and practice across sectors and at different timescales of impacts. Coherent and well planned cross-sectoral and regional planning will enable the effective management of necessary trade-offs so as to prioritize interventions and the allocation of resources. Related emerging good practices, as presented in the submissions, include the following:

(a) While autonomous climate change adaptation has occurred in a decentralized manner in the past and will continue to do so in the future, recent efforts have sought to integrate adaptation into relevant existing development or sectoral plans, taking into account the considerable research that has been conducted on climate change impacts and the costs of and opportunities for adaptation within a national development context;

(b) Integrating adaptation by reviewing and modifying or adjusting policy and planning instruments is not to be restricted to the environmental sector or to public authorities, but should be extended to economic sectors and private organizations;

<sup>40</sup> See <<https://e3geoportal.ecdc.europa.eu/>>.

<sup>41</sup> Relevant further information, including on heatwave action plans, is available from the WHO regional office for Europe at <<http://www.euro.who.int/en/health-topics/environment-and-health/Climate-change>>, and from the European Climate Adaptation Platform at <<http://climate-adapt.eea.europa.eu/web/guest/health>>.

<sup>42</sup> See <[http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0018/190404/WHO\\_Content\\_Climate\\_change\\_health\\_DruckII.pdf](http://www.euro.who.int/__data/assets/pdf_file/0018/190404/WHO_Content_Climate_change_health_DruckII.pdf)>.

(c) Several entry points have been identified for integrating adaptation, such as legislation and regulations; existing strategies, standards, planning tools and assessment frameworks; research and development programmes; and networks and working groups;

(d) Strategies and action plans should be regularly revised taking into account advances in climate change science, research and technology and societal developments.

40. **Effective coordination and clarity on roles and responsibilities among environment and sectoral and/or other ministries and between various governance levels** is essential to achieving effective planning and implementation of adaptation actions (e.g. organization of regular meetings of interministerial and other working groups).

41. **Involvement of stakeholders, including both government and non-government stakeholders, is key to ensuring effective adaptation planning processes.** Building partnerships and engaging stakeholders is the best way to support more resilient development and avoid conflicts and inequalities. Good practices and lessons drawn in this regard, shared in the submissions, include the following:

(a) Maintaining commitment of the various stakeholders to the implementation of national adaptation plans is a challenge owing to the multiplicity of initiatives. It is therefore important for adaptation programmes to be flexible, and to continuously engage and communicate with stakeholders. It is also critical to ensure that programmes are integrated into ongoing government or regional processes so as to ensure continued support and engagement;

(b) Engaging local stakeholders should ensure that the process is grounded in local knowledge and understanding of issues; that the outcomes of different activities are legitimate and influential; and that the capacity and knowledge of local stakeholders is built to undertake targeted adaptation actions. Combining local and scientific knowledge systems is important for making climate information relevant locally and for empowering communities. Local adaptive capacity could be enhanced by including communication and use of climate information in adaptation planning processes and enabling communities to live with the uncertainty and risks that climate change presents;

(c) Shared learning, public dialogues and participatory assessments and projects could help to build local ownership. Promoting open dialogue, building local institutional capacity, and promoting participation in projects and assessments are key ingredients for continuing efforts to increase urban climate resilience;

(d) Participatory multi-stakeholder processes should ensure that these methods and approaches are sustained after the initial engagement finishes;

(e) While participatory approaches to learning and action can be effective in empowering and enhancing participation of communities, this will only be achieved where there is sufficient capacity to effectively facilitate this process and analyse the outputs. Without this in place, participatory approaches can become data extraction exercises without benefits to the community.

42. **Non-governmental stakeholders can provide an important pathway for building resilience**, especially when there are challenges or limits to working directly with governments.

43. Knowledge gaps, including those related to information on costs and benefits of adaptation, risks and uncertainties, vulnerability at local level, and data for monitoring and evaluation should be addressed through **coordinated research and effective sharing of available information and experiences** (e.g. through international, regional or national adaptation platforms). To this end, the following good practices and lessons have been identified:

(a) Knowledge-sharing networks and peer-to-peer learning can be effective tools for addressing knowledge gaps. Multi-stakeholder working groups and knowledge platforms have been effectively used, for example, in a BirdLife project to build capacity and awareness, promote coordination, share experiences and facilitate adaptive management. Where possible, existing working groups and knowledge platforms should be used and enhanced to avoid redundancy and improve cost-effectiveness;

(b) Knowledge sharing is most effective when it spans multiple levels and disciplines, engaging policymakers and those making decisions on the ground. An example of this is provided by BirdLife in Kenya, which involves 22 site community groups meeting twice a year to discuss climate change issues and their experiences with ecosystem-based adaptation, among other conservation and livelihood issues. The wealth of local knowledge shared among communities is captured by Nature Kenya, which shares it with national multi-stakeholder working groups and uses it to inform local and national policy decisions. The information is also passed on to the secretariat of the BirdLife Africa Partnership for regional dissemination.

44. With respect to assessment and planning, **understanding the vulnerabilities, capacities and development priorities and aspirations of people, and accessing and interpreting climate information from past trends and future scenarios into accessible and usable messages relevant to the local conditions, is critical to achieving climate-resilient development.** Some good practices and lessons drawn in this regard include:

(a) Supporting the application of local knowledge and community engagement and action is essential for building up the resilience of natural and societal systems, and for delivering locally appropriate solutions to help communities, countries and economies to adapt. Under the Birdlife project Ecosystem Conservation for Climate Change Adaptation in East Africa, participatory learning and action tools were used to enable communities to analyse their own vulnerability and adaptation options and to empower them to take action. In Burundi, community adaptation plans were used to inform the integration of ecosystem-based adaptation into the Ruyigi municipal development plan. CARE's participatory scenario planning toolkit uses an iterative process of collective sharing and interpretation of climate forecasts, ensuring that climate data informs local adaptation decision-making;

(b) With regard to differential vulnerabilities, capacities, priorities and aspirations of people, it is important that gender consideration be a part of national adaptation planning (e.g. conducting gender and power analysis for understanding drivers of change and monitoring gender dynamics and differentiated impacts) in order to make adaptation planning effective.

45. The following **good practices have emerged with respect to implementing targeted adaptation actions:**

(a) Promoting the development and diffusion of technologies is an important adaptation intervention. An example thereof is the community-based early flood warning system employed in the Hindu Kush Himalayan region as a part of ICIMOD's efforts to minimize the impact of excess water. It provides early warnings to downstream communities and enhances upstream–downstream sharing of real-time flood information;

(b) Adopting a landscape approach can help to ensure that adaptation interventions take into account the functional scale of ecosystems and systems with which they interact, thereby enhancing the effectiveness of adaptation responses. For example, the BirdLife project Enhancing Climate Change Resilience in Great Lakes Region Watersheds operates at landscape units called climate-resilient altitudinal gradients, which have a minimum altitudinal range of 1,000 metres to allow for upward shifts in the distribution of species and habitats. The landscape approach requires structures to coordinate adaptation

across political and administrative borders (e.g. Lake Victoria basin, which spans four countries);

(c) Shifting the traditional planning designs of systems to those that encompass more resilience (i.e. resilient alternate pathways) can create positive, long-lasting economic returns when taking into consideration the losses and damages associated with future climatic impacts. For example, resilient housing designs can cost-effectively reduce losses in vulnerable communities due to floods, storms, and high temperature. As climate changes, resilient designs can contribute substantially to the adaptive capacity and resilience of poor communities by reducing structural, asset, and income losses. Access to affordable resilient housing designs and the funding required to implement them is especially important to the poor and near-poor who have limited access to land and housing;

(d) The results of Nansen Initiative's consultations in the Pacific, Central America, and the Greater Horn of Africa have demonstrated the importance of incorporating human mobility, including voluntary migration and planned relocation, into national adaptation plans.<sup>43</sup> Voluntary migration, whether circular, temporary, or permanent, can be a potentially positive form of adaptation to climate change. On the other hand, planned relocation, if well managed and undertaken in a participatory fashion, could be an effective strategy for assisting communities in adapting to climate change impacts;

(e) Adapting to climate change will require the mobilization of financial resources from both dedicated multilateral climate funds and domestic budgets, as well as the efficient use of available public funds. Governments need to make use of partnerships and networks with other governments, regional bodies and international actors to access the funding.

**46. Monitoring and evaluation is important for the effectiveness and efficiency of action plans.** The following related good practices and lessons have emerged:

(a) It will be important to ensure that relevant stakeholders are engaged and emphasis is placed on the process of continuous learning. For example, CARE's participatory monitoring, evaluation, reflection, and learning process seeks to provide a platform for local stakeholders to articulate their priorities and vision of change, with a view to building adaptive capacity among the poor and the vulnerable. It also seeks to instigate continuous and joint learning and reflection among these groups. BirdLife's Toolkit for Ecosystem Service Site-based Assessment,<sup>44</sup> an ecosystem valuation approach, has been used in combination with participatory learning and action tools to help understand the vulnerability of communities and identify appropriate adaptation options;

(b) Provisions to monitor and evaluate selected adaptation options need to focus on the outcomes of implemented adaptation activities and on how effective these adaptation actions are in reducing identified risks and enhancing climate resilience. At the national level, several EU member States are developing or implementing a monitoring, a reporting or an evaluation system. The objectives of these systems vary from evaluating the preparedness of a country to evaluating a specific policy measure. Countries are using a variety of approaches for their schemes, such as a review by an independent body or self-assessment by actors in different sectors;

(c) Monitoring and evaluating responses is also important for avoiding potentially maladaptive developments. Successful implementation must be supported by appropriate arrangements to monitor and evaluate whether the adaptation policy is on track and is achieving its objectives, and to learn how future adaptation efforts might be

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<sup>43</sup> See <[http://www.nanseninitiative.org/sites/default/files/Horn%20of%20Africa%20Outcome%20Document%20%28Final%20May%202014%29\\_0.pdf](http://www.nanseninitiative.org/sites/default/files/Horn%20of%20Africa%20Outcome%20Document%20%28Final%20May%202014%29_0.pdf)>.

<sup>44</sup> See <<http://www.birdlife.org/worldwide/science/assessing-ecosystem-services-tessa>>.

enhanced. An example of a concrete action that resulted from an evaluation exercise is “water culture”, a 20-year programme of rainwater crop systems, aquifer recharge and floods and droughts control in the city of Hermosillo, Sonora, a State located in the north-west of Mexico, where water was scarce for several decades. The evaluation exercise concluded that there was a significant decrease in the volume of water consumed per capita;<sup>45</sup>

(d) WRI’s monitoring and evaluation framework facilitates periodic review and adjustment of the adaptation intervention, so that adaptation practice can improve over time and simplifies reporting to national authorities, funders or to the international community.<sup>46</sup> The framing tool developed by ISET is an example of an economic tool for evaluating adaptation interventions that investigated how to catalyse climate and disaster resilience by developing a new framing tool for qualitative cost-benefit analysis.<sup>47</sup> ISET uses this process to provide framing for and insights into investigating how communities perceive the benefits and costs of different strategies and to support further research team investigation of the quantitative costs and benefits.

47. **Lessons learned on facilitating the national adaptation plan process** were also presented in the submissions, including the following:

(a) The national adaptation plan process should be well coordinated, integrated, and inclusive; this requires the involvement of the relevant ministries, different levels of government, and a broad range of stakeholders. It is important that sufficient capacity, tools, and information be developed and made available so that the national adaptation plan process can continue in individual countries;

(b) Linking the national adaptation plan process with other ongoing national processes, policies, programmes and projects will ensure effective integration of climate resilience considerations into the development process;

(c) Climate change and other stressors can affect the attainment of development goals and how countries can identify and prioritize the actions, policies, and resources necessary to respond to these threats and achieve their development vision. Thus it is important for countries to share findings, experiences, and lessons learned about integrating climate change into their economic development processes. Exchange of experiences can promote learning. Regional thematic workshops could provide an avenue for technical training and for promoting a South–South exchange;

(d) Relevant ongoing initiatives can be used as entry points for taking forward the national adaptation plan process within countries.

#### IV. **Good practices and lessons learned, related to processes and structures for linking national and local adaptation planning**

48. Adaptation planning should balance top-down with bottom-up approaches in a continuous process, where one approach informs the other. The information and priorities generated at the local level are as valuable for national planning as guidance from the national level is for the framing of local level action.

49. There are multiple entry points for linking national and local adaptation planning. Some **good practices and key lessons** have emerged with respect to developing and strengthening such linkages.

<sup>45</sup> See <[http://www.inecc.gob.mx/descargas/cclimatico/adap\\_cclimatico.pdf](http://www.inecc.gob.mx/descargas/cclimatico/adap_cclimatico.pdf)> (in Spanish).

<sup>46</sup> See <[http://www.wri.org/sites/default/files/pdf/making\\_adaptation\\_count.pdf](http://www.wri.org/sites/default/files/pdf/making_adaptation_count.pdf)>.

<sup>47</sup> See <<http://training.i-s-e-t.org/module-series-3/>>.

**50. Institutional frameworks and processes are in place in certain countries for strengthening the link between national and local adaptation planning.** They include:

(a) Some countries have embarked on developing processes for linking national and local adaptation planning. Example includes Nepal's National Framework on Local Adaptation Plans For Action, complementary to its NAPA;

(b) In Nepal, the national-level priority framework for action<sup>48</sup> on increasing resilience to climate change and climate-related extreme events is one of the five priority measures identified under Nepal's draft agriculture development strategy for increasing agricultural productivity. Nepal's NAPA<sup>49</sup> and its National Strategy for Disaster Risk Management have created a strong momentum for integration of climate risk concerns into agricultural priorities, and call for on the ground action to address both immediate and future impacts. In response to the call made by the Government of Nepal, FAO facilitated a multi-stakeholder interactive process to prepare the priority framework for action 2011–2020. This framework provides a road map for addressing the impacts of risks associated with extreme climate events and climate change and seeks to ensure that risk management and climate change adaptation measures are based on national and local priorities, with a strong institutional basis for implementation;

(c) The EU adaptation strategy package and national adaptation strategies and action plans provide an institutional framework and the financial resources and capacities for action at the local level, which can help enhance knowledge through research and the sharing of existing information, such as through adaptation platforms;

(d) The South African Government prepared a national white paper<sup>50</sup> that supports the mandate for local municipalities to respond to climate change. The Let's Respond Guide Toolkit has been developed by the Department of Environmental Affairs, the Department of Cooperative Governance and Traditional Affairs, and the South African Local Government Association to assist with this mandate by mainstreaming climate change into local integrated development plans through an intensive process of facilitation and training supported by the national government and by organizations such as Conservation South Africa;

(e) The National Framework Strategy for Climate Change of 2011, a national road map for creating a climate risk-resilient Philippines, has the general goal of building the country's adaptive capacity and increasing the resilience of natural ecosystems to climate change, and of optimizing mitigation opportunities.

**51. Another key opportunity for linking local and national adaptation processes is through the provision of funding and/or direct access to funding.** Some good practices shared in this regard include:

(a) Some countries have begun to set up national funds for climate change, with the broad mandate of delivering resources to vulnerable communities. The People's Survival Fund Law of 2012 amended by the Philippines Climate Change Act of 2009 supports adaptation actions at the local level by providing long-term finance streams that will enable the government to address climate change effectively. The Fund will assist local governments in their adaptation activities, such as in the areas of land and water resources management, agriculture and fisheries, health, infrastructure development and natural ecosystems;

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<sup>48</sup> See <<http://www.fao.org/docrep/015/an713e/an713e00.pdf>>.

<sup>49</sup> See <<http://unfccc.int/resource/docs/napa/npl01.pdf>>.

<sup>50</sup> Available at <<http://www.sanbi.org/sites/default/files/documents/documents/national-climate-change-response-white-paper.pdf>>.



(b) Through the direct access finance modality, countries can get financial resources directly through accredited institutions or national implementing entities. This not only offers an opportunity for learning and capacity development, but also for coherent and integrated programmes at the national level, which can support the needs at the local scale more effectively.

**52. The focus on disaster risk reduction provides a useful entry point for strengthening the link between local and national adaptation planning.** The following are some good practices in this context:

(a) CARE and partners have employed an integrated community-based adaptation and disaster risk reduction approach in Bangladesh, which combines traditional knowledge with innovative strategies to improve the adaptive capacities and resilience of char dwellers to disaster and climate change impacts. Climate change adaptation considerations are first integrated into local government disaster management plans, which then collectively inform local government development plans;

(b) To ensure the linking of national to local disaster risk management planning, the District Disaster Risk Management Planning<sup>51</sup> process in Nepal uses the framework of sectors and priority areas outlined by the National Strategy for Disaster Risk Management. To avoid the duplication of efforts at the local level, the priorities of the NAPA and this strategy are considered as guiding principles for the formulation of local plans. The planning aims to ensure that disaster risks are addressed in a coordinated manner by engaging government line agencies, development partners, local institutions and local communities. Local stakeholder workshops and feedback sessions contributed to the development of detailed priorities for planning purposes.

**53. Integrating climate change adaptation considerations into sectoral and development planning processes of local bodies and governments also helps to strengthen the linkage between local and national adaptation planning.** Some examples provided in this context include:

(a) The information from South Africa's Long-Term Adaptation Scenarios Flagship Research Programme supports a cross-sectoral approach to planning at the national level. The information also provides a basis for downscaling to the local level through integration of climate change adaptation considerations into provincial climate change response strategies. These response strategies can then provide the guiding framework for the local integrated development planning;<sup>52</sup>

(b) Climate change adaptation in the agriculture sector of the Magellan region in Chile represents another good practice of collaboration on developing an adaptation plan for the forestry, livestock and agriculture sectors. A planning tool was developed in collaboration with FAO. It involved identification and integration of adaptation measures for the agriculture sector, as well as measures for enhancing local adaptation capacities of farmers and institutions based on impact analysis of future scenarios at the subnational level;

(c) Several adaptation actions are ongoing in cities across the EU, which demonstrates these cities' commitment to developing a comprehensive local adaptation strategy or integrating adaptation to climate change into relevant existing plans;<sup>53</sup>

<sup>51</sup> See <<http://www.fao.org/climatechange/35702-031dac721bf7bf63928c01de3ae048669.pdf>>.

<sup>52</sup> See <<http://www.sanbi.org/biodiversity-science/state-biodiversity/climate-change-and-bioadaptation-division/ltas>>.

<sup>53</sup> More at <<http://resilient-cities.iclei.org/bonn2014/open-european-day/>>.

(d) With a view to developing activities related to the integration of human mobility issues into national and local adaptation and territorial development planning, IOM and the Colombian Ministry of Environment organized a workshop that brought together different national and local level actors, such as ministerial officials and representatives of local civil society in the field. This event constituted a first step towards linking national and local adaptation planning with a focus on migration/mobility, and is potentially an example that can be replicated in the future in other countries.

54. Several key lessons have emerged on **developing and strengthening partnerships and collaboration between different stakeholders**, as summarized below:

(a) It is essential to recognize and leverage networks and partnerships that already exist in cities, countries and between countries, including by engaging and working with additional cities and influencing the ways organizations, including non-governmental organizations, donors, and international financial institutions, approach urban climate change resilience (e.g. lessons learned through ISET projects). Further linking between such city actions and national adaptation strategies can be beneficial and enhance effectiveness (e.g. lessons learned from cities in the EU context);

(b) It is important to establish clear roles and responsibilities for the various governance levels (in particular urban, subnational and national) and flexible and coordinated institutions to achieve effective mainstreaming of adaptation;

(c) National governments need to strengthen efforts (including allocation of resources) to enhance the knowledge of local communities on supporting local level resilience to climate change. Province and district government offices have a crucial role in bridging national policies and local implementation;

(d) It is also imperative to have structured strategic processes in place that foster an information and knowledge exchange between communities, scientists, and policymakers to inform the decision-making process and make it more inclusive (e.g. lessons learned through ICIMOD's Adaptation Learning Highways).

## V. Summary

55. Certain elements common to the submissions received from Parties and NWP partner organizations have emerged on adaptation planning processes addressing ecosystems, human settlements, water resources and health, as well as on linking national and local adaptation processes.

56. One of the key messages is **the importance of integrating adaptation planning into development and sector planning and implementation**. Development and sector plans and budgets need to be based on actions that will result in climate-resilient development, whether or not finance specific to adaptation has been accessed. Climate-specific interventions, in turn, must have clear development benefits.

57. The following key messages have emerged with respect to **the consideration of vulnerable sectors and communities in adaptation planning processes**:

(a) Adaptation plans, need to focus on reducing current and future vulnerabilities across all vulnerable sectors and on increasing the climate change adaptive capacities of the most vulnerable people and communities;

(b) Social inequalities and differentiated vulnerability including gender considerations needs to be addressed at all levels of response to climate change, from the local to the national level, given that they form an important and often insufficiently addressed barrier to equitable adaptation;

(c) Building on and promoting the application of the principles of community-based adaptation could be helpful for national adaptation planning, as this facilitates the identification of the underlying causes of climate vulnerability, supports appropriate choices of adaptation options grounded in the local context, supports a healthy balance of ‘hard’ (infrastructure) and ‘soft’ (practice and process) measures, is cost-effective, and builds on existing knowledge and capacities in addressing climate variability and shifts and related issues.

58. To ensure robust adaptation planning processes, **decision-making processes in adaptation planning need to be informed by local and scientific information** (e.g. on the viability of specific technical interventions). Critically, to be adaptive and climate-resilient, interventions must be decided through an informed and iterative planning process with the participation of the people whose lives are affected by climate change.

59. One of the key messages is that **partnerships and “working with others” is often a key factor in successful adaptation**. Since climate change impacts all members of society and can have complex and cascading impacts, it requires concerted and coordinated efforts of both governmental and non-governmental actors to develop appropriate solutions. Working with existing civil society networks and platforms can strengthen the link between local and national level adaptation planning.

60. With respect to strengthening the link between national and local adaptation planning, **the national adaptation plan process under the Cancun Adaptation Framework offers an important opportunity for countries to link national planning processes to local knowledge and experiences**. However, specific guidance, measures, and mechanisms are needed to link local level experiences and national priority-setting processes.

61. As regards **the strengthening of monitoring and evaluation**, the following key messages have been identified:

(a) Because the monitoring and evaluation of adaptation is complicated by a shifting baseline, and given the presence of many confounding factors and the perceived need to demonstrate additionality, indicators for monitoring progress should be robust and measurable, clearly linked to available or acquirable data sets, and clearly linked to climate change exposure, sensitivity and adaptive capacity;

(b) Stakeholder consultation is critical in the development of a set of appropriate indicators for evaluating adaptation, and requires institutional coordination across all sectors to ensure that a full representation of all adaptation activities and indicators also captures cross-sectoral activities;

(c) Effective evaluation of impacts relies on the collection of good relevant baseline information, tracking of planned and implemented resilience-building activities against the defined indicators, and the occurrence of a climate/weather-related extreme event, after which the effectiveness of the interventions can be assessed;

(d) Given the complex and dynamic response of species, ecological communities and ecosystems to climate impacts, and the fact that determining effective monitoring guidelines for ecosystems in such conditions is challenging, a combination of both traditional reference-state monitoring and evaluation systems is essential. Also critical are approaches that help to track the dynamic qualities of resilience inherent to ecological systems and that enable auto-adaptation, such as connectivity, integrity of the disturbance regime (e.g. fire, monsoon, tropical cyclone or flow regime) and habitat heterogeneity.

62. **The importance of knowledge management systems has been identified as one of the common elements**. There is a need to foster and inculcate systematic learning and knowledge management that links the lessons from projects at the local level to the national

and international levels and that conveys appropriate information on adaptation priorities addressing ecosystems, human settlements, water resources and health. It is therefore important to deliver information more effectively to practitioners through carefully designed activities and products. These activities may include, among others:

- (a) Regional learning workshops and forums that facilitate a South–South learning exchange;
- (b) Collaboration between adaptation practitioners and adaptation financiers to bridge the gap between the understanding of adaptation practice and funding trends or mechanisms;
- (c) Sharing of knowledge and experiences, learning, and collaboration under regional and global adaptation knowledge management initiatives such as the NWP.

## Annex

[English only]

### Examples of methods and tools for adaptation planning processes addressing ecosystems, human settlements, water resources, and health<sup>1</sup>

Table 1  
Available and implemented methods and tools of adaptation planning processes addressing ecosystems

Organization	Tool and method	Description	Planning &	
			Assessment	Implementation
International Centre for Integrated Mountain Development	Himalayan Climate Change Adaptation Programme <sup>a</sup>	The programme aims to provide national and regional level research on ecosystem-based adaptation, make functional a payment mechanism for ecosystem services at the local (watershed) level, to undertake a detailed social and economic valuation of ecosystem services and to prepare a methodology for economic valuation developed and tested at watershed level, and identify and recommend a set of adaptation options for ecosystems and communities	✓	✓
World Resources Institute (WRI)	Coastal Capital series <sup>b</sup>	WRI and its partners have used the results from economic valuation studies of coral reefs and mangroves in five Caribbean countries to identify and provide support for policies that help to ensure healthy coastal ecosystems and sustainable economies. Building on this, WRI has produced a guidebook on ecosystem valuation for decision-making in the Caribbean	✓	✓
Conservation International (CI)	Vulnerability assessment <sup>c</sup>	Based on an ecosystem approach, CI's subnational level vulnerability assessment for the Bogota–Cundinamarca region now provides important information on vulnerability to more than 10 million people affected by impacts to key ecosystem services	✓	
Cooperative for Assistance and Care Everywhere (CARE), World Wide Fund for Nature and International Union for Conservation of Nature	Community and ecosystem approach integration <sup>d</sup>	The framework for better integration of ecosystem and community-based adaptation approaches helps address the shortcomings of the mainstream, top-down, 'hard' (infrastructure) based approaches to adaptation. The approach has been successfully utilized in Nepal's USAID-funded Hariyo Ban project, informing preparation and implementation of adaptation plans at various levels, from the community to the district and landscape levels		✓

<sup>a</sup> See <<http://www.icimod.org/hicap/?q=4779>>.

<sup>b</sup> Go to <<http://www.wri.org/our-work/project/coastal-capital-economic-valuation-coastal-ecosystems-caribbean>>.

<sup>c</sup> Go to <<http://www.conservation.org/projects/Pages/Adapting-to-a-Changing-Climate-in-Colombia.aspx>>.

<sup>d</sup> More at <[http://www.careclimatechange.org/files/adaptation/ELAN\\_IntegratedApproach\\_150412.pdf](http://www.careclimatechange.org/files/adaptation/ELAN_IntegratedApproach_150412.pdf)>.

<sup>1</sup> The examples provided in the annex are based only on information contained in the submissions received.

Table 2  
**Available and implemented methods and tools of adaptation planning processes addressing human settlements**

<i>Organization</i>	<i>Tool and method</i>	<i>Description</i>	<i>Planning &amp;</i>	
			<i>Assessment</i>	<i>Implementation</i>
European Union (EU) (Sweden)	Revised surface water system	Revising the surface water system of the city of Malmö to include canals, dams and green roofs has allowed for better storage of rain water and slower discharge of this water to nearby streams, thereby reducing urban flooding		✓
Institute for Social and Environmental Transition (ISET)	Climate Resilience Framework <sup>a</sup>	This framework for vulnerability looks at cities through the lens of agents, institutions and systems, and provides a more complete understanding of vulnerability by highlighting areas not often associated with an impact	✓	
ISET	Shared Learning Dialogues <sup>b</sup>	This multi-stakeholder assessment and planning methodology helps integrate local knowledge and issues. Outcomes developed and endorsed by local stakeholders are more legitimate and influential, and help build local capacity and knowledge		✓
Urban Climate Change Research Network	Case Study Docking Station <sup>c</sup>	A web-based, extractable database to inform both research and practice on climate change and cities, it enables researchers and practitioners to access peer-validated data on climate-related risks and vulnerabilities for cities, as well as on implemented mitigation and/or adaptation measures	✓	✓
EU (Austria)	Integrated flood risk management <sup>d</sup>	Under the EU flooding directive, after each Austrian flooding event, interdisciplinary research initiatives fill existing knowledge gaps and provide detailed recommendations, significantly reducing future flood damage		✓
ISET	Design competitions <sup>e</sup>	Design competitions increase the likelihood that creative ideas will be produced by engaging local design institutions and students and creating localized interest in issues likely to extend well beyond the duration of the competition or project		✓

<sup>a</sup> See <<http://i-s-e-t.org/projects/crf.html>>.

<sup>b</sup> See <<http://i-s-e-t.org/resources/working-papers/climate-resilience-paper-1.html>>.

<sup>c</sup> Go to <<http://uccrn.org/2014/07/01/call-for-arc3-2-case-studies/>>.

<sup>d</sup> See <[http://ec.europa.eu/environment/water/flood\\_risk/](http://ec.europa.eu/environment/water/flood_risk/)>.

<sup>e</sup> More at <<http://i-s-e-t.org/projects/shelter.html>> (includes information on the 2013 Resilient Housing Design Competition).

Table 3

**Available and implemented methods and tools of adaptation planning processes addressing water resources**

<i>Organization</i>	<i>Tool and method</i>	<i>Description</i>	<i>Assessment</i>	<i>Planning &amp; Implementation</i>
European Union (EU) (Flemish Region in Belgium, and Netherlands)	Pumping station <sup>a</sup>	Due to severe drought on the Maas River, Europe's largest Archimedes screw pumping stations were set up on the Albert Canal locks to augment water supply. Now, drought no longer threatens water supply, the screws are used as an electricity generator in times of excess water, and biodiversity outcomes have improved through fish-friendly design		✓
World Resources Institute (WRI)	Aqueduct platform <sup>b</sup>	Provides countries and river basins with risk exposure scores. The tool helps to analyse climate variabilities and risks and identifies areas of uncertainty that need to be factored into the national adaptation plan process	✓	
EU (Sweden)	Agricultural flood protection	Two stage ditches allow water to overflow an upper flood stage instead of the field, while vegetation stabilizes the soil. Broadening the traditional trenches in Åkra has helped protect farm production		✓
EU (Spain)	CEDEX impact assessment <sup>c</sup>	Through CEDEX, climate change impacts are assessed on water bodies and resources in Spain related to water resources in the natural regime, water demands, exploitation systems, and the ecological state of water bodies	✓	
International Centre for Integrated Mountain Development	Community-based flood early warning system <sup>d</sup>	A low-cost option that reduces flood risk through investing in early warning systems, and builds understanding of spring hydrology, appropriate policies, and institutions to minimize the impact of water shortages. The system is likely to promote a better understanding of the sociopolitical dimensions of coping with water scarcity		✓
World Health Organization	Guidance on water supply in extreme weather <sup>e</sup>	The guidance provides an overview of why and how adaptation policies should consider the vulnerability of health and environment due to new risk elements arising from adverse weather episodes. This integrated approach helps steer the development and discussion of guidance		✓
Global Water Partnership (GWP)	Integrated Water Resources Management (IWRM) ToolBox <sup>f</sup>	As an information exchange platform, the toolbox provides water-related practitioners and professionals with the opportunity to discuss and analyse the various elements of the IWRM process, and facilitates the prioritization of actions, thus improving water governance and management. Has been successfully utilized in South-Eastern Asia to create awareness, develop country-based IWRM capacity, and facilitate the development		✓

Organization	Tool and method	Description	Assessment	Planning & Implementation
of quality case studies				
World Meteorological Organization /GWP	Integrated Drought Management Programme (IDMP) <sup>g</sup>	The programme produces policy-relevant results tailored to specific regional and national needs, and contributes to drought-related efforts by providing a better scientific understanding of drought risk assessment; monitoring, prediction, and early warning; policies and plans for drought preparedness; and drought risk reduction. For example, IDMP Central and Eastern Europe provides beneficial outputs such as a compendium of good practices, a drought information exchange platform, and capacity-building training and workshops	✓	✓
EU (Sweden)	Open surface water system <sup>h</sup>	In Malmö, an open surface water system consisting of dams, canals and some green roofs was opened in the 1990s. It slows down and stores rainwater before draining it into a nearby stream. In Augustenborg, an undersized surface water system has been adapted to the prevailing climate, which has stopped the occurrence of flooding despite heavy rains. This means that Augustenborg is now well prepared for future climate scenarios		✓
WRI	Natural Infrastructure for Water <sup>i</sup>	The programme is dedicated to scaling up smart, cost-effective solutions. It identifies water risks, unveils natural infrastructure opportunities, and informs smart strategies for securing water resources	✓	✓
Mexico	Water culture <sup>j</sup>	In response to an evaluation exercise, Mexico released a 20-year programme of rainwater crop systems, aquifer recharge and floods and droughts control called “water culture” in the city of Hermosillo, Sonora, a state located in the north-west of Mexico, where water was scarce for several decades. The programme has been implemented as a result of the evaluation exercise that concluded that there is a significant decrease in the volume of water consumed per capita		

<sup>a</sup> Go to <<http://www.amice-project.eu/en/amice-project.php?refraction=31>>.

<sup>b</sup> More at <<http://www.wri.org/our-work/project/aqueduct>>.

<sup>c</sup> More at <[http://www.magrama.gob.es/es/agua/temas/planificacion-hidrologica/planificacion-hidrologica/EGest\\_CC\\_RH.aspx](http://www.magrama.gob.es/es/agua/temas/planificacion-hidrologica/planificacion-hidrologica/EGest_CC_RH.aspx)> (in Spanish).

<sup>d</sup> See <<http://www.icimod.org/?q=9204>> for a prototype example.

<sup>e</sup> See <[http://www.unece.org/fileadmin/DAM/env/water/whmop2/WHO\\_Guidance\\_EWE\\_Final\\_draft\\_web\\_opt.pdf](http://www.unece.org/fileadmin/DAM/env/water/whmop2/WHO_Guidance_EWE_Final_draft_web_opt.pdf)>.

<sup>f</sup> See <<http://www.gwp.org/ToolBox/>> and <<http://gwpsea-toolbox.net/>>.

<sup>g</sup> More at <<http://www.droughtmanagement.info/>>.

<sup>h</sup> See <[http://climate-adapt.eea.europa.eu/viewmeasure?ace\\_measure\\_id=3311#adapt\\_options\\_anchor](http://climate-adapt.eea.europa.eu/viewmeasure?ace_measure_id=3311#adapt_options_anchor)>.

<sup>i</sup> See <<http://www.wri.org/our-work/project/natural-infrastructure-water>>.

<sup>j</sup> <[http://www.inecc.gob.mx/descargas/cclimatico/adap\\_cclimatico.pdf](http://www.inecc.gob.mx/descargas/cclimatico/adap_cclimatico.pdf)> (in Spanish).



Table 4

**Available and implemented methods and tools of adaptation planning processes addressing human health**

<i>Organization</i>	<i>Tool and method</i>	<i>Description</i>	<i>Planning and Assessment implementation</i>	
European Union (EU) (Austria and Italy)	Heatwave protection and prevention plans	The Styria and Carinthia regional governments in Austria and the Emilia-Romagna region in Italy have implemented heatwave prevention/protection plans. In Austria, the plan provides information on heat stress and regional temperature prognoses to vulnerable community members in kindergartens, hospitals, and elderly care homes, for example. In Italy, the plan provides residents with more information on how the urban heat island effect impacts temperatures		✓
EU (Spain)	Health and climate change observatory <sup>a</sup>	Provides a system of indicators on health and climate change, the creation, maintenance and management of a database and a web platform on climate change and health to promote communication and social participation, coordination of a network of scientific experts to provide a basis for collaboration and facilitation of communication and collaboration among different government institutions, and periodic monitoring and evaluation of the effects of climate change policies on health		✓
World Health Organization (WHO)	Guidance to protect health through adaptation planning <sup>b</sup>	The guide ensures health sector decision makers work with partners and other related communities. It assists decision makers in following a systematic process to engage in the national adaptation plan process at the national level, identify national goals to build health resilience, and develop a national plan with prioritized activities to achieve these goals	✓	✓
United Nations Institute for Training and Research and WHO	Advanced learning package <sup>c</sup>	The initiative supports designing and implementing results-oriented and sustainable learning to address climate change. The process also helps map current gaps in knowledge and technical guidance to build resilient health systems		✓
EU (Sweden)	Heatwave adaptation: Climatools <sup>d</sup>	The Climatools research project has helped improve municipality preparedness for heatwaves through the development of tools such as checklists to be used during heatwaves. The project has resulted in increased awareness and preparedness for heatwaves in the municipality, and can be used in ongoing planning processes such as comprehensive and detailed planning and risk and vulnerability assessments		✓
WHO and World Meteorological Organization (WMO)	Mainstreaming gender in health adaptation <sup>e</sup>	The guide provides programme managers with information on mainstreaming gender through all four phases of the project cycle: identification, formulation and design, monitoring and evaluation, and implementation		✓

WHO	Vulnerability and adaptation assessment guidance <sup>f</sup>	Providing basic and flexible guidance on conducting national and subnational assessment of current and future vulnerability, the assessment outcome gives decision makers information on the extent and magnitude of likely health risks, and on priority policies and programmes that prevent and reduce the severity of future impacts	✓	✓
WMO	Global Framework for Climate Services <sup>g</sup>	The programme supports addressing the existing climate information and data needs related to food security, health, and disaster risk reduction so that better decisions on risk management and climate adaptation can be made		✓
WHO	Updated guidance on global funding opportunities <sup>h</sup>	WHO generates mapping and constant updates of available entry points for addressing human health issues under the main global climate change funding streams and with funds from bilateral and international donors, assisting those looking for funding opportunities		✓
WHO	Climate change economics tool <sup>i</sup>	The tool helps analyse health costs associated with the ‘business as usual’ scenario, costs associated with the measures needed to minimize or prevent health damage, and summary indicators of the economic performance of adaptation measured in terms of cost effectiveness or economic benefits versus costs. It provides quantitative information on health damage costs, adaptation costs and efficiency ratios		✓

<sup>a</sup> More at <[http://oscc.gob.es/es/general/observatorio/el\\_observatorio\\_es.htm](http://oscc.gob.es/es/general/observatorio/el_observatorio_es.htm)> (in Spanish).

<sup>b</sup> More at <<http://www.climateandhealthalliance.org/resources/international-guidance>>.

<sup>c</sup> Go to <[http://unclearn.org/sites/www.unclearn.org/files/images/resource\\_guide\\_on\\_understanding\\_the\\_cc\\_and\\_health\\_interface.pdf](http://unclearn.org/sites/www.unclearn.org/files/images/resource_guide_on_understanding_the_cc_and_health_interface.pdf)>.

<sup>d</sup> See <<http://www.foi.se/en/Custom--Partners/Projects/Climatools/Climatools/>>.

<sup>e</sup> Go to <<http://www.who.int/globalchange/publications/en/>>.

<sup>f</sup> See <<http://www.who.int/globalchange/resources/adaptationresources/en/>>.

<sup>g</sup> See <<http://gfcs.wmo.int/>> and <[http://www.wmo.int/pages/governance/ec/global-framework-for-climate-services\\_en.html](http://www.wmo.int/pages/governance/ec/global-framework-for-climate-services_en.html)>.

<sup>h</sup> Go to <<http://www.who.int/globalchange/resources/adaptationresources/en/index3.html>> (please see the links to various types of funding sources at the bottom of the page).

<sup>i</sup> Go to <[http://www.euro.who.int/\\_data/assets/pdf\\_file/0018/190404/WHO\\_Content\\_Climate\\_change\\_health\\_DruckII.pdf](http://www.euro.who.int/_data/assets/pdf_file/0018/190404/WHO_Content_Climate_change_health_DruckII.pdf)>.

Table 5  
**Available and implemented monitoring and evaluation tools and methods**

<i>Organization</i>	<i>Tool and method</i>	<i>Description</i>
World Resources Institute (WRI)	Monitoring and evaluation options report <i>Making Adaptation Count</i> <sup>a</sup>	WRI's monitoring and evaluation framework is designed to help keep implementation on track. The framework facilitates adjustment of the adaptation intervention and simplifies reporting to national authorities, funders or to the international community. It also facilitates periodic review and revision of the adaptation intervention, so that adaptation practice can improve over time
Cooperative for Assistance and Care Everywhere (CARE)	Participatory monitoring, evaluation, reflection and learning process <sup>b</sup>	CARE's participatory monitoring, evaluation, reflection, and learning process supports community-based adaptation initiatives. It also seeks to provide a platform for local stakeholders to articulate their own needs, priorities and vision of change, since empowerment is a fundamental part of building adaptive capacity among the poor and the vulnerable. It also seeks to instigate continuous and joint learning and reflection among these groups
Birdlife International	Toolkit for Ecosystem Service Site-based Assessment <sup>c</sup>	This ecosystem valuation approach was combined with participatory learning and action tools to help to understand community vulnerability and identify appropriate adaptation options. The assessment facilitated communication to communities and policymakers of the importance of ecosystems and the implications of alternative land uses
Institute for Social and Environmental Transition (ISET)	Climate resilience cost-benefit analysis process <sup>d</sup>	ISET's framing tool is an example of an economic tool for evaluating adaptation interventions. ISET investigated how to catalyse climate and disaster resilience by developing a new framing tool for qualitative cost-benefit analysis. ISET uses this process to provide framing for and insights into investigating how communities perceive the benefits and costs of different strategies and to support further research team investigation of the quantitative costs and benefits
European Union (EU)	Monitoring, reporting, and evaluation scheme	The objectives of this scheme vary from evaluating the preparedness of a country to evaluating a specific policy measure. The EU member States implementing this scheme use a variety of approaches, for example a review by an independent body and self-assessment by actors in different sectors
World Health Organization	Lessons learned from five years of implementation of health adaptation <sup>e</sup>	The synthesis report will draw from successful practices and effective interventions identified in evaluation reports from health adaptation projects either completed or nearing completion. In addition to the benefits gained from an understanding of how experience with previous projects may help improve current and future projects, the evaluation will also try to draw on experience in scaling up interventions in environmental health areas, such as water and sanitation

<sup>a</sup> Available at <[http://www.wri.org/sites/default/files/pdf/making\\_adaptation\\_count.pdf](http://www.wri.org/sites/default/files/pdf/making_adaptation_count.pdf)>.

<sup>b</sup> See <[http://www.careclimatechange.org/files/CARE\\_PMERL\\_a\\_revised\\_manual.pdf](http://www.careclimatechange.org/files/CARE_PMERL_a_revised_manual.pdf)>.

<sup>c</sup> See <<http://www.birdlife.org/worldwide/science/assessing-ecosystem-services-tessa>>.

<sup>d</sup> More at <<http://training.i-s-e-t.org/module-series-3/>>.

<sup>e</sup> Go to <<http://www.who.int/globalchange/projects/adaptation-climate-change/en/>> (the synthesis report forms part of this project).