



Best practices and available tools for the use of indigenous and traditional knowledge and practices for adaptation, and the application of gender-sensitive approaches and tools for understanding and assessing impacts, vulnerability and adaptation to climate change

Technical paper

Summary

This technical paper provides a literature review and analysis of best practices and available tools for: the use of indigenous and traditional knowledge and practices for adaptation; and the application of gender-sensitive approaches and tools for understanding and assessing impacts, vulnerability and adaptation to climate change. Drawing on an extensive list of literature and examples from diverse regions and sectors and different decision contexts, this technical paper highlights best practices and available tools for, identifies gaps in, as well as recommends possible actions to enhance, the application of indigenous and traditional knowledge and practices for adaptation and the use of gender-sensitive approaches and tools for understanding and assessing impacts, vulnerability and adaptation to climate change.

Contents

	<i>Paragraphs</i>	<i>Page</i>
I. Executive summary	1–13	3
A. Introduction	1–3	3
B. Available tools for the use of indigenous and traditional knowledge and practices for climate change adaptation	4–8	3
C. Application of gender-sensitive approaches and tools for understanding and assessing impacts, vulnerability and adaptation to climate change	9–13	4
II. Introduction	14–21	5
A. Background	14–17	5
B. Scope and approach	18–20	6
C. Structure	21	7
III. Available tools for the use of indigenous and traditional knowledge and practices for adaptation	22–66	8
A. Indigenous and traditional knowledge systems and climate change adaptation	22–29	9
B. Review of available tools for the use of indigenous and traditional knowledge and practices for adaptation	30–64	13
C. Current trends, gaps and recommendations	65–66	25
IV. Application of gender-sensitive approaches and tools for understanding and assessing impacts, vulnerability and adaptation to climate change	67–144	27
A. Introduction	67–77	27
B. Review of the application of gender-sensitive approaches and tools for understanding and assessing impacts, vulnerability and adaptation to climate change	78–130	33
C. Current trends, gaps and recommendations	131–144	50
V. Conclusions	145–150	51
Annexes		
I. List of references		53
II. An explanation of terms		61

I. Executive summary

A. Introduction

1. Based on an extensive review of relevant information and literature, this technical paper presents a review of best practices and available tools for the use of indigenous and traditional knowledge and practices for adaptation, and the application of gender-sensitive approaches and tools for understanding and assessing impacts, vulnerability and adaptation to climate change. It also provides a preliminary analysis of emerging trends and gaps in the integration of indigenous and traditional knowledge (ITK) and gender sensitivity into adaptation to climate change, and recommendations on addressing some of those gaps.

2. With the increased attention being paid to adaptation in the climate change policy debate, the uneven distribution of impacts and vulnerability between regions and among social groups becomes critical. As such, factors such as livelihood assets, sources of income, class, social status, race, ethnicity, indigenous identity, gender and poverty are defining both vulnerability and capacities to adapt to climate change.

3. Much has been said about the lack of attention paid to gender aspects and ITK during the initial phases of the global climate change policy process. However, as shown in this technical paper, there is a wide range of tools, approaches and practices that are being applied in various development contexts, including climate change adaptation, to promote the application of ITK and gender sensitivity in adaptation projects.

B. Available tools for the use of indigenous and traditional knowledge and practices for climate change adaptation

4. In intergovernmental fora, especially those that focus on the environment, there has been an increased importance placed on ITK and issues related to its inclusion, protection and continued transmission. While work has advanced, particularly in relation to biodiversity, the consideration of ITK within the context of climate change is a relatively new development and one that is starting to receive more attention. To date, ITK has mostly been used to improve observations of climate change and its impacts, and for the assessment of impacts, vulnerability and adaptation, particularly in vulnerability assessments. There is little evidence of the integration of ITK into the implementation and monitoring of adaptation. Moreover, existing approaches and tools in observation and assessments may not be robust enough to appropriately incorporate ITK into adaptation planning and implementation; rather they serve primarily to increase the participation of indigenous peoples and local communities in decision-making processes.

5. For many indigenous peoples and local communities adaptation action may undermine their adaptive capacity rather than reinforce their resilience. This risk is further magnified if ITK continues to be perceived as only a static or 'traditional' information source, implying that it could be subject to limits and not recognizing the interlinkages between ITK and adaptation in the face of climate change. Best practices and tools should create and sustain an enabling environment for the fullest expression of adaptive capacity, recognizing the contributions of ITK as a knowledge base, alongside science, for promoting effective adaptation and understanding of the impacts of climate change.

6. Given that local communities only began experiencing climate change impacts some 20 years ago, and that research into community observations and responses began only 10 years ago, it is perhaps not surprising that governments and organizations have had, as yet,

limited experience of building ITK into climate change processes. The review consequently focused on analysing the mobilization of ITK, demonstrated through an as yet limited number of experiences, practices and tools across all components of adaptation, namely observation, assessment, planning, implementation and monitoring and evaluation (M&E), as well as cross-cutting practices and tools.

7. The following trends with regard to the tools and practices reviewed were noted: (a) with respect to observation, local-level research by scientists, non-governmental organizations (NGOs) and indigenous peoples is being carried out on observations of climate change impacts and response, and there are also projects and initiatives to build synergies between ITK and science for improved climate forecasting; (b) under assessment, a range of participatory and information and communication technology (ICT) tools are being used for vulnerability analyses that encourage the participation of indigenous peoples and local communities; however, it was noted that participation does not guarantee, in and of itself, that ITK is adequately and appropriately built into adaptation; and (c) under planning, implementation and M&E, tools or modalities that recognize and incorporate ITK have yet to be developed and piloted.

8. To address the gaps identified and emerging needs, it is recommended that initial guidelines are developed on approaches and tools for the use of ITK in adaptation through a process involving transdisciplinary natural and social science experts and relevant knowledge holders from indigenous peoples and local communities.

C. Application of gender-sensitive approaches and tools for understanding and assessing impacts, vulnerability and adaptation to climate change

9. That men and women should have the same opportunities to participate, contribute to and benefit from development efforts is a clear human right and it is an underlying principle of international agreements, including the UNFCCC Convention. But it is also recognized that women are disproportionately impacted by climate change. Men and women play different roles in society and can bring different sets of resources, capacities and knowledge, but also needs and requirements, to initiatives for climate change adaptation.

10. To fully integrate both men and women's perspectives into adaptation initiatives, including vulnerability and impact assessments, there is a need to pay special attention to gender sensitivity in all phases of the initiatives, including climate change vulnerability and impact assessments. To respond to that need, organizations and communities involved in climate change adaptation have developed and adapted various gender-sensitive tools, approaches and practices in the preparation, implementation and M&E of adaptation initiatives.

11. Many of the tools, approaches and practices respond particularly to the fact that women are often in a disadvantageous position with regard to their active participation in the development and implementation of adaptation initiatives. Practices for women's empowerment therefore play an important role in many gender-sensitive adaptation initiatives. However, gender roles are highly context-specific, both in time and space. Practices therefore need to be developed and adapted continuously on the basis of gender analysis that shows the roles of men and women in specific contexts.

12. Policy frameworks have increasingly provided the basis for gender-sensitive planning and implementation of climate change adaptation efforts and there are a growing number of concrete practices for gender-sensitive initiatives. Based on the review of tools and approaches that are applied to promote gender sensitivity in adaptation initiatives, it appears that there is a need for more research to establish the linkage between gender

sensitivity and the effectiveness of such adaptation initiatives. It has also been noted that gender-disaggregated information systems are fundamental for gender-sensitive development activities, but a lack of gender-disaggregated data continues to be a major challenge for gender mainstreaming and ultimately ensuring gender equality.

13. To strengthen gender-sensitive climate change adaptation, there is a need for guidance on how to develop gender strategies and action plans and how to apply them, with the provision of frequent updates. It is recommended to develop a framework for monitoring gender sensitivity in all components of the adaptation process. It is essential that the indicators for the monitoring framework are intuitive, cross-cultural and easily understood by adaptation practitioners without specialized gender-related knowledge. Moreover, the monitoring framework should include possibilities for assessing identified barriers to gender-sensitive approaches.

II. Introduction

A. Background

14. In the context of the Nairobi work programme on impacts, vulnerability and adaptation to climate change (NWP), the Subsidiary Body for Scientific and Technological Advice (SBSTA), at its thirty-eighth session, requested the secretariat to prepare a technical paper before SBSTA 39 on best practices and available tools for the use of indigenous and traditional knowledge and practices for adaptation, and the application of gender-sensitive approaches and tools for understanding and assessing impacts, vulnerability and adaptation to climate change.^{1,2} This paper was prepared under the guidance of the Chair of the SBSTA, and in collaboration with relevant organizations, and will inform the technical expert meeting to be organized before SBSTA 40 on the use of indigenous and traditional knowledge and practices for adaptation, and the application of gender-sensitive approaches and tools for understanding and assessing impacts, vulnerability and adaptation to climate change, with a view to developing relevant recommendations for practitioners. Recent technical workshops held under the NWP on ecosystem-based approaches for adaptation to climate change³ and on water and climate change impacts and adaptation strategies,⁴ discussed the importance of including indigenous and traditional knowledge and the need for considering gender sensitivity as cross-cutting themes within the context of discussions at both workshops.

15. With the increased attention being paid to adaptation in the climate change policy debate, the need to recognize and address the uneven distribution of impacts and vulnerability between regions and among social groups becomes critical. As such, factors such as livelihood assets, sources of income, class, social status, race, ethnicity, indigenous identity, gender and poverty are defining both vulnerability and capacities to adapt to climate change. Much has been said about the lack of attention paid to gender aspects and ITK during the initial phases of the global climate change policy and response agenda. However, it is generally recognized that policy-relevant vulnerability assessments and effective adaptation require an understanding of not only how different social groups are affected but also how different groups can bring vital resources to the adaptation process.

¹ FCCC/SBSTA/2013/3, paragraph 17.

² See <<http://www.unfccc.int/nwp>> for details on the NWP.

³ Report on the technical workshop on ecosystem-based approaches for adaptation to climate change is available at <<http://unfccc.int/resource/docs/2013/sbsta/eng/02.pdf>>.

⁴ Report on the technical workshop on water and climate change impacts and adaptation strategies is available at <<http://unfccc.int/resource/docs/2012/sbsta/eng/04.pdf>>.

This includes adaptive capacity in the form of indigenous and local knowledge, which may also be gender specific, reflecting women and men's different but complementary roles, for instance in environment and natural resource management. In fact, according to Mearns and Norton (2009), gender and indigenous identity and knowledge are two of the most critical characteristics defining vulnerability to climate change as well as climate action.

16. There is, therefore, a need for tools such as participatory approaches and empowerment efforts, in addition to analysis, highlighting the linkages and interaction between climate change, adaptation, ITK and gender, among other factors. Such tools and approaches may address both ITK as well as gender issues, although additional efforts may be required to ensure that the practices are applied in an integrated manner. However, both issues also have their unique characteristics that call for specific approaches and tools. Moreover, most applications so far have a unique focus on either the use of indigenous and local knowledge or gender sensitivity, with only few applications including the interaction between ITK and women.

17. This technical paper will therefore address the issues separately, but take note of actual or potential overlaps and also explore synergies between the two issues, in particular the inclusion of gender-sensitive approaches as a best practice when applying ITK in adaptation.

B. Scope and approach

18. This technical paper includes a review and synthesis of information on best practices and available tools for the use of indigenous and traditional knowledge and practices for adaptation, and the application of gender-sensitive approaches and tools, drawing examples from different regions and sectors and from different adaptation contexts. To enable a robust and comprehensive review of best practices, the secretariat requested NWP partner organizations⁵ and other relevant organizations with pertinent expertise and experiences to provide inputs. In response to that request, organizations contributed 42 examples of gender-sensitive approaches and 35 examples of indigenous and traditional knowledge and practices for adaptation.⁶ Moreover, many contributing organizations provided reference material, such as handbooks, guidelines and policies, which were included in the review.

19. The desk review for the preparation of this technical paper focused particularly on the material provided by NWP partner organizations. In addition, the review included general studies and literature, as well as available relevant online project documents, progress reports and other relevant information. Special attention was given to ensuring balanced regional coverage, to the extent possible. To provide further clarification and insights, concrete examples of the use of indigenous and local knowledge and gender-sensitive approaches in other disciplines, but highly relevant to their application in adaptation, are provided.

20. An explanation of the key terms used in this paper is provided in the annex II.

⁵ See <<https://www.unfccc.int/nwp>> for details on NWP partner organizations.

⁶ With the permission of the organizations, their contributions have been made available in a database on indigenous and traditional knowledge and practices for adaptation at <<http://unfccc.int/7769>> and a database on gender-sensitive approaches and tools for understanding and assessing impacts, vulnerability and adaptation at <<http://unfccc.int/7786>>, respectively.

C. Structure

21. Following this introduction, chapters III and IV address the two themes of this technical paper: best practices and available tools for the use of indigenous and traditional knowledge and practices for adaptation, and for the application of gender-sensitive approaches and tools for understanding and assessing impacts, vulnerability and adaptation to climate change, respectively. Each of those chapters includes a chapter summary (see box 1 for Chapter III summary and box 8 for Chapter IV summary), an introduction to some of the general issues under each theme, a review and synthesis of best practices and available tools, as well as an analysis of current gaps and trends. Building on the discussions in chapters III and IV, chapter V concludes the paper with a list of key findings, challenges and recommendations.

III. Available tools for the use of indigenous and traditional knowledge and practices for adaptation

Box 1

Chapter summary

- Indigenous and traditional knowledge (ITK) contributes fine-grained, long-term observations about the changing environment. It is essential for understanding not just local-level impacts of climate change but also the range of options that a community might consider for adaptation that are appropriate to its ecological and sociocultural environments and in conformity with its priorities, values and worldviews.
- Recognition of the significance of ITK for climate change has only begun to emerge at the international level in the last few years. For the most part, however, that recognition is based on a documentation of actions that local communities are taking on their own initiative. The challenge for governments, organizations and institutions is to identify policies, decisions and actions that might support those communities and enhance their efforts to mobilize ITK for climate change assessment and adaptation.
- Given that local communities only began experiencing climate change impacts some 20 years ago, and that research into community observations and responses began only 10 years ago, it is not surprising that governments and organizations have had, as yet, limited experience in building ITK into climate change processes.
- The following trends and gaps with regard to the tools and practices reviewed were noted: (a) with respect to observation, local-level research by scientists, non-governmental organizations and indigenous peoples is being carried out on observations of climate change impacts and response, and there are also projects and initiatives under way to build synergies between ITK and science for improved climate forecasting, whereas there are no regional or national observing systems incorporating ITK; (b) in relation to impacts, vulnerability and adaptation assessments, a range of participatory and information and communication technology tools are being used for vulnerability analyses that encourage the participation of indigenous peoples and local communities; however, it was noted that participation does not guarantee, in and of itself, that ITK is adequately and appropriately built into adaptation, and there is also a need for methodologies to fully understand the linkages between ITK and adaptation; and (c) in relation to adaptation planning, implementation and monitoring and evaluation, tools or modalities that recognize and incorporate ITK have yet to be developed and applied.
- The review found that, while there was recognition of the role of ITK in adaptation, it was mainly concentrated in the early stages of the adaptation process, primarily observation and assessment. Few tools and practices demonstrate the ability to invest in the design, planning and transdisciplinary approach needed to incorporate ITK.
- Many tools used at the community level claim to offer direct access to observations and knowledge from community members. Invariably, however, such methods focus on narrowly delimited aspects of vulnerability, development or adaptation planning. Existing practices and tools are thus unable to adequately grasp the multiple dimensions of ITK. Rather than reinforcing adaptation action and aligning it with community needs and aspirations, ill-adapted tools may instead alienate ITK holders and distort and denature their contributions.
- An initial development of guidelines on the mobilization of ITK across all components of adaptation could provide decision makers and practitioners with modalities and tools for linking ITK with scientific knowledge and using ITK in adaptation decision-making, recognizing the role of relevant international policies and best practices.

A. Indigenous and traditional knowledge systems and climate change adaptation

1. Indigenous and traditional knowledge

22. This paper uses the definitions applied by the United Nations bodies concerned with issues related to ITK and the environment (see box 2).

23. In addition to highlighting the diverse, holistic, cultural and intergenerational character of ITK, its practice-based and intellectual nature and the relationship of ITK with the natural environment, there are several other concepts related to ITK that contribute to understanding its relevance to decision-making on climate change adaptation. Recognizing that ITK is accumulated, reviewed and adapted over generations, it is erroneous to view it as immutable and fixed in time and/or space. Instead it emerges “through a history of involvement in an environment...[and] just as ecosystems shift and alter, so does the resultant knowledge gained for consistent interaction with that system” (Ingold and Kurtilla, 2000). Berkes (2009) makes the explicit point that “indigenous elders cannot transmit an actual knowledge of climate change; what they can do is to teach what to look for and how to look for what is important”. That caution illustrates the dangers in assuming that ITK is static content, when it is in fact a dynamic process that involves observing, discussing and assessing new information. Indeed, the knowledge itself, viewed as entrenched sets of information, may be less important in the context of change than the values and traits embedded in and transmitted through knowledge systems, such as the capacity to innovate in the face of novel and unknown circumstances, the patience and determination to persist when things do not go as planned and the willingness to experiment and learn from experience (Takano, in Ford et al., 2007).

2. Emerging recognition of the value of indigenous and traditional knowledge for climate change assessment and response

24. Communities living in environments that are particularly vulnerable to early climate change impacts, such as the Arctic, high-altitude zones, desert margins and low-lying coastal areas, only recently began to observe impacts and respond to climate change. For example, Inuit hunters in the high Arctic report that they began to notice significant and unusual environmental change that can be attributed to climate change from the 1990s onwards (Berkes and Jolly, 2002; Krupnik and Jolly, 2002; and Gearheard et al., 2010). Still more recently, outside entities and organizations have become aware of the on-the-ground experiences, observations and responses of local communities in the face of climate change, and, from such awareness, an appreciation of the significant role of ITK has grown.

25. Recognition of the significance of ITK for climate change has only begun to emerge at the international level in the last few years. The Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), published in 2007, triggered an enhanced focus climate change adaptation. The shift towards adaptation has been accompanied by an increase in the attention paid to impacts and responses at the national, subnational and local levels, including an increasing appreciation of the observations and actions of local communities that are rooted in ITK.

Box 2

Definitions of indigenous and traditional knowledge applied by United Nations bodies and agencies

Convention on Biological Diversity (CBD):

Traditional knowledge is the knowledge, innovations and practices of indigenous and local communities around the world. Developed from experience gained over the centuries and adapted to the local culture and environment, traditional knowledge is transmitted orally from generation to generation. It tends to be collectively owned and takes the form of stories, songs, folklore, proverbs, cultural values, beliefs, rituals, community laws, local language and agricultural practices, including the development of plant species and animal breeds. Sometimes it is referred to as an oral traditional for it is practiced, sung, danced, painted, carved, chanted and performed down through millennia. Traditional knowledge is mainly of a practical nature, particularly in such fields as agriculture, fisheries, health, horticulture, forestry and environmental management in general.

United Nations Educational, Scientific and Cultural Organization (UNESCO):

Local and indigenous knowledge systems refer to the understandings, skills and philosophies developed by societies with long histories of interaction with their natural surroundings. For rural and indigenous peoples, local knowledge informs decision-making about fundamental aspects of day-to-day life. This knowledge is integral to a cultural complex that also encompasses language, systems of classification, resource use practices, social interactions, ritual and spirituality. These unique ways of knowing are important facets of the world's cultural diversity and provide a foundation for locally-appropriate sustainable development.

Owing to ongoing negotiations, an accepted definition currently does not exist within the forum of the World Intellectual Property Organization (WIPO); however, WIPO makes the following points:

Traditional knowledge is the knowledge, know-how, skills, innovations or practices that are passed between generations in a traditional context and that form part of the traditional lifestyle of indigenous and local communities who act as their guardian or custodian.

Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES):

Indigenous and local knowledge refers to the multi-faceted arrays of knowledge, know-how, practices and representations that guide societies in their innumerable interactions with their natural surroundings. This interplay between people and place has given rise to a diversity of knowledge systems that are at once empirical and symbolic, pragmatic and intellectual, and traditional and adaptive.

The IPBES working definition goes on to further propose using Berkes' definition of indigenous and local knowledge, which is:

A cumulative body of knowledge, practice and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment.^a

Sources: CBD. *Traditional Knowledge and the Convention on Biological Diversity*. Available at <<http://www.cbd.int/traditional/intro.shtml>>; UNESCO. 2002. *Local and Indigenous Knowledge Systems*. Available at <<http://www.unesco.org/links/>>; WIPO. *Glossary*. Available at <<http://www.wipo.int/tk/en/resources/faqs.html#a2>>; and IPBES. 2013. *Consideration of initial elements: recognizing indigenous and local knowledge and building synergies with science*. IPBES/1/INF/5. Available at <http://www.ipbes.net/images/documents/IPBES_1_5_En.pdf>.

^a Berkes F. 2012. *Sacred Ecology*. Third edition. New York: Routledge.

26. Understanding the nature and relevance of ITK for climate change adaptation is a new and rapidly expanding area of collaborative investigation, involving indigenous peoples, local communities and scientists. Several literature reviews of that body of research have been published in the last five years. Roncoli, Crane and Orlove (2009) list 192 published papers in a recent review of epistemological and methodological approaches to climate change in cultural anthropology, while Crate (2011) references 136 sources on climate and culture in an article for the *Annual Review of Anthropology*. Looking specifically at farmers' responses to climate predictions, Roncoli (2006) surveyed 154 references. Most recently, the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the United Nations University (UNU) (Nakashima et al., 2012) cite over 300 references in *Weathering Uncertainty: Traditional Knowledge for Climate Change Assessment and Adaptation*, which provides an overview of key issues and areas of research. Practical approaches to adaptation that utilize the services of healthy ecosystems have been implemented in various forms by different communities for some time. UNFCCC (2011) recognizes the conservation of traditional knowledge as co-benefits of ecosystem-based approaches to adaptation.

27. The expanding body of scientific and grey literature primarily documents ITK as a basis for community-based observations of climate change impacts and traditional practices and mechanisms that may provide a robust basis for climate change response. In China and the Philippines, for example, the UNU Institute for Sustainability and Peace (2013) found that the effective use of water through water storage and infiltration facilities enhances groundwater recharge to reduce the drying up and subsequent collapse of rice terraces. Such traditional practices may enhance resilience in the face of a changing climate. Similarly, in the Andes, communities traditionally develop *qochas*, rectangular excavations with two side channels that allow them to collect and store run-off water during the rainy season. That water can then be used for livestock, to improve pastures or to irrigate small gardens. *Qochas* as a practice are embedded in *ayllu*, a traditional community structure that provides for local-level action and consensual decision-making (Conservation International, 2013). In Egypt, traditional storage methods, such as burying grain in the sand or constructing granary rooms in houses, may assist farmers in the face of increasing climate unpredictability and resulting food insecurity (Parrish, 1994). Box 3 provides a list of United Nations knowledge platforms and resources where a selection of the diverse range of ITK relevant to impact assessments and adaptation can be found.

Box 3

Knowledge platforms and resources on indigenous and traditional knowledge and climate change

- The technology for agriculture platform of the Food and Agriculture Organization of the United Nations, available at <<http://teca.fao.org>>, provides an online platform for practical information on agricultural technologies and practices to help small producers in the field.
- The Local Coping Strategies Database of the UNFCCC, available at <<http://maindb.unfccc.int/public/adaptation/>>, provides examples of knowledge related to coping with weather hazards, including shifting seasons, drought, erratic rainfall, floods, sea level rise, storms, extreme heat and cold and vector-borne diseases.
- Climate Frontlines, of the United Nations Educational, Scientific and Cultural Organization (UNESCO), available at <www.climatefrontlines.org>, an inter-agency platform for indigenous knowledge and climate change, provides a repository of indigenous observations and knowledge of climate change, including discussions on early impacts, coping with change, rituals and spirituality, and impacts of climate mitigation action.
- Advance Guard, available at <www.ias.unu.edu/resource_centre/UNU_Advance_Guard_Compendium_2010_final_web.pdf>, is a publication by the United Nations University (UNU) Traditional Knowledge Initiative that provides a compendium of case studies on climate change adaptation, mitigation and indigenous peoples.
- Weathering Uncertainty: Traditional Knowledge for Climate Change Assessment and Adaptation, available at <www.ipmpcc.org>, is a publication by UNESCO and UNU that reviews scientific and grey literature and analyses key issues and emerging trends.

28. Documentation and research is also uncovering initial efforts by communities to respond to climate change impacts. In north-east India, the Asian Indigenous Peoples Pact (2012) noted that the Tangkhul Naga villages' attentive observation of a subtle shift in seasons has led to the revival of sustainable rotational agriculture, governed by traditional local leadership structures. In addition, research in the Sahel by Nyong, Adesina and Osman Elasha (2007) found that pastoralists integrate mobility and active management of their multi-species composition of herds to survive drought.

29. Finally, response to disasters, hazards and other extreme events may also provide input relevant to indigenous knowledge and adaptation. Farmers in Haiti traditionally apply a number of actions, before and after natural hazards, in order to reduce their impacts, particularly on high market value crops like bananas. Such actions include the removal of leaves and the immediate sale or storage of marketable fruit.⁷ In Tuvalu families often have their food stores (*kaufata*) stocked with enough preserved foods to help them through a cyclone or drought event (Nakashima et al. 2012).

⁷ See <<http://teca.fao.org/read/6864>>.

B. Review of available tools for the use of indigenous and traditional knowledge and practices for adaptation

30. A strong case for the contribution that ITK can make to climate change assessment and response is being made by ongoing research. For the most part, however, the documentation relates to actions that local communities are taking on their own initiative. The challenge for governments, organizations and institutions, therefore, is to identify policies, decisions and actions that might support those communities in their efforts to enhance climate change assessment and adaptation through the mobilization of their ITK. This section attempts to examine current practices and tools that enhance the incorporation of ITK into climate change adaptation processes.

1. Efforts to mobilize indigenous and traditional knowledge for climate change adaptation

31. While the examination of adaptation support provides interesting trends, it is important to note that few, show any evidence of the use of ITK in adaptation action. The global research-policy agenda is only starting to investigate the role of indigenous knowledge in adaptation, as evidenced by the introduction of a section on indigenous knowledge for the first time in the IPCC Fifth Assessment Report.

32. Upon analysis, the practices and tools proposed for the incorporation of ITK into adaptation are often the same tools that seek to build community development or participation into decision-making. Such practices and tools embedded in participatory development work are not robust enough to meet the much more demanding challenge of elucidating and understanding ITK.

33. In analysing available practices and tools relevant to ITK for adaptation, it is important to distinguish between the tools that focus mainly on vulnerability and impact and those that address adaptation. Some ascribe to adaptation a character of “change of state” (Adger, 1996). The emphasis on a change of state in order to reduce vulnerability has certain implications for how ITK is perceived by designers and users of various tools. If a change of state or transformation underpins the objectives of adaptation action, then, for many indigenous peoples and local communities, adaptation action may run the risk of undermining their adaptive capacity rather than reinforcing their resilience. That risk is further magnified if such knowledge is perceived as only static or ‘traditional’, implying it could be subject to limits, especially in contemporary and changing environments (see chapter A above for a discussion of ITK as content versus process).

34. In understanding how ITK for adaptation can be fostered, it is equally important to highlight policy decisions that facilitate the “fullest expression of indigenous adaptive capacity” (Ford et al., 2010), including promoting an environment for the continued transmission of ITK. Such policies may include those that maintain the integrity of and access to traditional territories, reinforce local practices for sustaining crop or herd diversity, and enhance the transmission of ITK, values, attitudes and worldviews (Ford et al., 2007; Ford, Pearce, Duerden et al., 2010; and Nyong, Adesina and Osman Elasha, 2007, as quoted in Nakashima et al., 2012).

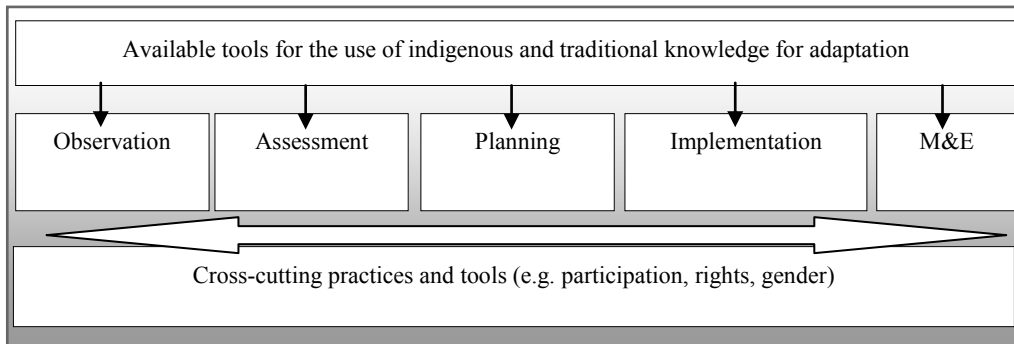
35. Coupled with good policy decision-making processes are the inclusion of local capacity-building, including strengthening local organizations, the inclusion of ITK holders as key partners in the development of climate change research and adaptation plans, and promoting the continued transmission of ITK.

36. The review of practices and tools for the use of ITK for adaptation assesses the mobilization of ITK within each of the following steps of adaptation: observations of climate change and its impacts; assessment of impacts of and vulnerability and adaptation

to climate change; and adaptation response, including planning, implementation and M&E.⁸ Furthermore, it provides a summary of cross-cutting practices that are relevant to each step and build an enabling environment for the use of ITK tools within each step. Figure 1 provides an illustrative framework.

Figure 1

Framework for the review of available tools for the use of indigenous and traditional knowledge for all steps of adaptation process



2. Indigenous and traditional knowledge and climate change observations: practices and tools

37. Observation relates to the observation and monitoring of climatic and non-climatic, socioeconomic and environmental variables, in relation to which climate change impacts can be found and attributed, and based upon which modelling and prediction can be improved.

38. While global and regional systematic observing systems do not incorporate ITK on weather and climate, improving weather and climate forecasting through the integration of science and indigenous knowledge is an area of growing interest. In the Pacific, Vanuatu’s National Advisory Board on Climate Change and Disaster Risk Reduction (2013) is adopting a national approach to including ITK towards improved seasonal forecasts and adaptation. Building on a series of discussions with chiefs and leaders and an exchange of knowledge between meteorologists and Tanna weathermen, Vanuatu is committing to a long-term collaborative approach in relation to traditional knowledge, climate change and disaster risk reduction. In West Africa, a similar initiative is being piloted by the Association for Indigenous Women and Peoples of Chad, the Indigenous Peoples of Africa Coordinating Committee and UNESCO, bringing together pastoralist M’bororo weather-forecasting knowledge with scientific seasonal and long-term forecasts. The initiative builds upon a series of dialogues and exchanges between indigenous and scientific knowledge holders, with the support of indigenous knowledge experts (Indigenous Peoples’ of Africa Coordinating Committee, 2011). The Climate Change Adaptation in Africa (CCAA) programme supported eight projects to investigate how seasonal climate forecasts developed by national meteorological services might be better integrated into agricultural and pastoral decision-making to strengthen livelihoods and food security (Ziervogel and Opere, 2010). While such projects demonstrate the potential in bringing together seasonal climate forecasts and indigenous forecasts, the CCAA programme recommended more exploration to improve forecasting, including identifying local predictors, both what they predict and their equivalent in meteorological terms. This should be explored in relation to climate change in order to help indigenous knowledge practitioners determine whether such indicators are altered by climate change. Meteorological services could start integrating

⁸ See <<https://unfccc.int/7006.php>>.

indigenous knowledge, such as phenological data, into their advisories to provide users with more broadly based information (Ziervogel and Opere, 2010).

39. Improved climate forecasting for climate resilience may also be promoted by enabling access to climate information so that it may be integrated into local decision-making. CARE International's "Joto Afrika: Climate communication for adaptation" provides an example of a platform where science can provide data for ITK holders to assess their decision-making on when to plant. By providing the capacity to develop rainfall records from their own community rain gauges, agropastoralists can take informed decisions on planting dates. In Kenya and Ghana, multiple avenues of culturally appropriate communications are used to ensure that advisories and forecasts are disseminated to farmers and livestock keepers (CARE International, 2013).

40. With appropriate design and planning, geographic information systems and mapping tools can facilitate the inclusion of specific sets of indigenous knowledge into the observation of climate change. Such ICT-based projects are typically designed to include ITK on a specific factor or variable. The information that is gathered can then be applied to understand the options in relation to that specific factor or variable. Satellite imagery is used in Russian Siberia to detect and guide reindeer herd movements, in order to avoid ice-covered pastures in winter, wildfires in summer, and rapidly expanding oil and gas infrastructure that threatens to bar traditional migration routes (Maynard et al., 2005). In the Canadian Arctic, the Nunavik Research Center, owned by indigenous peoples, uses satellite imagery, remote weather stations and ice core measurements conducted by indigenous hunters, combined with ITK observations and hunters' reports. The latter are provided through the traditional method of documentation, as well as through an online tool, to monitor how the changing ice cover is affecting the Arctic charr, a fish that forms a major part of the diet of the Inuit (Cheek, 2008).

41. In addition to being used to combine data from science and ITK for climate change observation, ICT tools can be harnessed to document and promote the transmission of ITK for adaptation. In the Solomon Islands, in Melanesia, a project funded by the International Fund for Agricultural Development (IFAD) and implemented by the Solomon Islands Development Trust promoted the recording of ITK on strategies for coping with natural disasters in 11 communities in Guadalcanal Province. A draft manual and video of the knowledge was recorded by the communities, emphasizing the different and complementary roles of men and women in coping with disasters. The project outcomes emphasized the importance of intergenerational knowledge transmission, increasing community self-esteem and cohesion (International Fund for Agricultural Development, 2012).

42. When appropriately implemented, ICT tools can also enable ITK to be expressed in the monitoring and reporting relevant to tracking environmental change and informing adaptation planning. Such tools can be customized to local circumstances. Cybertracker collects data using a personal digital assistant (PDA) with its global positioning system, camera and voice-recording functions. By customizing graphic interfaces, the Cybertracker software can overcome language and literacy barriers to the collection of local data. Furthermore, local knowledge can be integrated into the customization process. Once the data have been collected, they can be downloaded to a central computer for basic analyses and reporting. In Mexico, Cybertracker was used in a project to provide communities with the ability to monitor their own forest resources (Peters-Guarin and McCall, 2010). Though the project cited was primarily a community forestry management initiative in the context

of REDD-plus,⁹ pilot cases could be explored for similar use in local-level monitoring of climate impacts.

3. Indigenous and traditional knowledge and climate change impact, vulnerability and adaptation assessments: practices and tools

43. Assessment, alongside observation, is needed to inform the latter components of adaptation (i.e. planning and implementation). Adaptation assessment refers to the practice of identifying options for adapting to climate change and evaluating them in terms of criteria such as availability, benefits, costs, effectiveness, efficiency and feasibility.

44. As a methodology used in adaptation assessments, vulnerability assessment provides input to planning and policy measures that “enhance the ability to respond to stressors and secure livelihoods” (Parry et al., 2007). Vulnerability analysis, according to Ford et. al (2007) entails:

- (a) Identifying conditions that represent risks to the community;
- (b) Characterizing how communities experience and manage climatic risks;
- (c) Identifying processes and conditions that influence exposure to climatic hazards and determining the efficacy, availability and success of past and present adaptations;
- (d) Identifying opportunities for and constraints on adapting to climate change;
- (e) Identifying entry points for adaptation policy.

45. In accordance with the annotated guidelines for the preparation of national adaptation programmes of action (NAPAs),¹⁰ many NAPAs included assessments of vulnerability from the point of view of stakeholders, including local communities, based on their knowledge, though the methodologies are not documented. Surveying 37 out of the 49 NAPAs, the majority of the documents make reference to aspects of ITK, mostly in acknowledging ongoing local efforts to respond to changes in climate. The reference to aspects of ITK is clustered around the following domains: weather and climate forecasting; dependence on traditional medicine; sustaining rural livelihoods; and coastal and marine management.

46. While existing approaches and tools may be able to detect ITK related to some impacts of climate change and short-term coping, they do not necessarily offer a thorough analysis of the links between the ITK, resilience and adaptive capacity of a community. Whether a reconceptualization of the tools, increased capacity-building for the use of existing approaches, increased capacity-building on ITK and adaptation or all of the above is needed could be a topic for further analysis.

47. Current vulnerability assessment tools designed for implementation at the community level are used by different actors in the development process, with different tools used independently or in combination by project planners and implementers. Mostly developed by humanitarian, development and aid agencies, such approaches and tools find their roots in disaster risk reduction, water management, sustainable livelihoods and other development sectors. The tools are meant to promote the participation of local-level stakeholders in the adaptation planning process and may facilitate an initial exchange of information and concerns among indigenous and local communities and other stakeholders.

⁹ Policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries.

¹⁰ Least Developed Country Expert Group (2002). Available at <http://unfccc.int/files/cooperation_and_support/ldc/application/pdf/annguide.pdf>.

Some of the tools make explicit reference to local knowledge and report that they focus on local perceptions and integrate local knowledge. They include:

(a) Climate Vulnerability and Capacity Analysis (CVCA), a tool developed by CARE to prioritize “local knowledge on climate risk and adaptation strategies in the data gathering and analysis process” (Dazé, Ambrose and Ehrhart, 2009). The handbook provides trainers and project implementers with a series of tools for use at different levels, including the use of secondary research, informant interviews, policy analysis, institutional mapping and participatory tools such as hazard mapping, seasonal calendars, historical timelines and a vulnerability matrix. CVCA has been applied in many countries in the regions of Africa, Asia-Pacific, the Caribbean, Central America and South America;

(b) MARISCO (Manejo Adaptativo de Riesgo y vulnerabilidad en Sitios de Conservación) (adaptive risk and vulnerability management at conservation sites), developed by the Centre for Economics and Ecosystem Management at Eberswalde University for Sustainable Development as a result of projects and workshops implemented in several countries, many of which were implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (2012). Through multi-stakeholder group discussion and the presentation of scientific data, the group assesses vulnerability;

(c) Vulnerability Reduction Assessment, implemented under the United Nations Development Programme (UNDP) Community-Based Adaptation programme, which consists of a “guided participatory rural appraisal, focusing on community perceptions of vulnerability to climate change and capacity to adapt” (Droesch et al., 2008). The approach utilizes a series of questions from which a numerical score can be generated, aggregated to serve as an index of adaptive capacity;

(d) From Vulnerability to Resilience, a tool designed by Practical Action as a framework for analysis and action to reduce vulnerability and strengthen the resilience of individuals, households and communities. The framework sets out the key factors that contribute to peoples’ vulnerability: exposure to hazards and stresses; fragile livelihoods; future uncertainty; and weak governance. It provides a series of participatory tools that can be used to build analyses of vulnerability, hazards, livelihoods, governance and future uncertainties (Pasteur, 2011).

48. Many available tools used at the community level claim to provide direct access to observations and knowledge from community members. Invariably, however, those methods focus on narrowly delimited aspects of vulnerability, development or adaptation planning. Furthermore, the procedures and protocols are established outside of the local context and therefore carry a high risk of predetermining inputs and answers, and thus restricting opportunities for indigenous and traditional perspectives, priorities and knowledge to enter the process. They are generally not sufficient to adequately understand the multiple dimensions of ITK. Seasonal calendars may illustrate this point. In many tools, the idea of using seasonal calendars as a method to provide local knowledge on the changes in the season is promoted. Participants are asked to fill in major planting and harvest events, times of festivals, migrations, hazards, etc. The information then becomes a framework for decision-making and the scheduling of activities. However, for many indigenous communities, months and seasons may not correspond with the conventional Occidental calendar. The start of a season may change from month to month in a given year as it may be tied to specific events, for example the flowering of certain trees or other changes in the landscape. Because of the numerous factors that may actually contribute to a community’s observation of the seasonal cycle, including spiritual messages, detailing a calendar depends as much upon the community discovering for itself how its own observations come together into understanding a ‘forecast’ or a shift in the season, as it does on the facilitator’s ability to be able to enumerate the types of event that may occur on a repeated or seasonal basis.

49. Participatory three-dimensional (3D) mapping integrates local knowledge “with data on elevation of the land and depth of the sea to produce stand-alone, scaled and geo-referenced relief models. The method combines geographic precision with local spatial knowledge” (Technical Centre for Agricultural and Rural Cooperation, 2012a). As the community works to build the model, the emerging discussions provide data relevant to understanding environmental change, facilitating the effective participation of local communities in the identification of policy priorities and actions needed to address the impacts of climate change. Several tools and guidance exist, including the Participatory Spatial Information Management and Communication tool, which has been used in the Pacific, the Caribbean and in Chad, Africa. In 2012, 106 Tobagonians participated in a participatory 3D mapping exercise that enabled the recording of observations of climate change on their island from all sectors of society, including farmers, fishers, hunters and tour operators. A total of 87 layers of information were displayed on the model, and citizens used it to explain to their government what they saw happening on their island and to urge action to address the impact of climate change (Technical Centre for Agricultural and Rural Cooperation, 2012b).

50. The Arctic Council’s Arctic Climate Impact Assessment (ACIA, 2005) is a successful approach to the collaboration of ITK with science that resulted in the incorporation of a broad set of observations from indigenous peoples alongside a regional assessment of the impacts of climate change in the Arctic. The participation of indigenous peoples’ representatives on the Arctic Council and the long history of cooperation with scientists and indigenous knowledge holders provided for the integration of ITK into all chapters of the report, with two chapters on indigenous perspectives and incorporating nine case studies into the report. Such collaboration led to a robust knowledge base on the impacts of climate change on the Arctic, with indigenous and scientific knowledge supporting each other; for example, biologists reviewed the changing caribou migration patterns as an impact of climate change, and indigenous knowledge was able to help explain how caribou migrations may be triggered by seasonal cues, such as day length, air temperature or ice thickness (Thorpe et al., 2001, as quoted in ACIA, 2005). In cases where indigenous and scientific observations did not agree, they could lead to new research on environmental change, deepening insights into the nature and impacts of environmental change.

4. Indigenous and traditional knowledge and adaptation planning, implementation, monitoring and evaluation: practices and tools

51. Despite the current tendency to confine ITK to the assessment stages of adaptation, the explicit inclusion of ITK from the earliest planning stages, including project conception, is a good practice that some countries have adopted. Uganda (2007) prioritized the maintenance, protection and continuity of the use of indigenous knowledge in the management of natural resources as a project in its NAPA (see box 4). Other least developed countries recognized the contribution of ITK in various ways: Ethiopia included the documentation and promotion of indigenous rangeland resource management as a way to enhance resource management practices; the United Republic of Tanzania (2007) advocated the promotion of indigenous knowledge in the agriculture sector; Mozambique included the role of local forecasting knowledge in a strengthened early warning system;¹¹ Bangladesh recognized that the development of knowledge for adaptation should include indigenous knowledge;¹² the Cape Verde Ministry of Environment and Agriculture promoted the need to understand traditional knowledge in relation to variations in the water

¹¹ Mozambique NAPA available at <<http://unfccc.int/resource/docs/napa/moz01.pdf>>.

¹² Bangladesh NAPA available at <<http://unfccc.int/resource/docs/napa/ban01.pdf>>.

cycle and agro-silvo-pastoral production systems;¹³ and Liberia (2008) recognized the need to better integrate indigenous and effective coping strategies into its national development policy and planning in order to better respond to the increasing frequency and intensity of climatic shocks so that the country will be in a better position to address the situation within the context of its existing sustainable development policy processes. Finally, Mauritania's NAPA (2004) acknowledges the different impacts of climate change on men and women, noting that: "women are often the chief guardians of vital local and traditional knowledge. Thus, they need to be recognized as key stakeholders in the consultation and decision-making processes, even though they have not been represented in great numbers".¹⁴

Box 4

Uganda's national adaptation programme of action

One of the projects proposed by Uganda in its national adaptation programme of action (NAPA) was the Indigenous Knowledge (IK) and Natural Resources Management project. Uganda felt that the project was necessary in order to document and understand IK so as to exploit its potential for adaptation. The NAPA mentions that a "lack of frameworks...coupled with total disregard of IK due to misconception and disrespect of cultural values" had resulted in a lack of research in the area. During the NAPA consultation process, indigenous practices were discussed, including the use of water harvesting and seeds to purify water in times of water scarcity and the need to understand traditional food preservation techniques to increase food security.

Source: Uganda. 2007. *Uganda National Adaptation Programmes of Action*. Available at <<http://unfccc.int/resource/docs/napa/uga01.pdf>>.

52. The Government of Nepal has created a national framework of local adaptation plans for action to support the operationalization of policy objectives outlined in the country's NAPA by "facilitating the integration of climate change resilience into local-to-national development planning processes and outcomes" (Government of Nepal, 2011). The framework consists of a series of steps to identify climate-vulnerable areas and peoples, prioritize adaptation actions, integrate those actions into local-to-national planning and identify service delivery agents and funding channels.

53. In the Pacific, Community Vulnerability and Adaptation Assessment and Action (CV&A) was developed by the Secretariat of the Pacific Regional Environmental Programme as an "anthology of activities that provides a learning process to empower local communities to identify, analyse and develop ways and means of increasing their local adaptive capacity to current and future challenges and opportunities related to climate change" (Nakalevu, 2006). CV&A field-tests a "participatory approach that integrates local knowledge and engages vulnerable communities in the formulation of adaptation plans that will be operable and most relevant to their circumstances. Integral to this idea was the development of practical tools, along with information and education, to ensure that the communities will have the necessary capacity to analyse climate risk and decide on adaptation strategies" (Asian Development Bank, 2011). Piloted in the Pacific countries of the Cook Islands, Fiji, Samoa and Vanuatu, the CV&A guide was subsequently used in 14 Pacific Island countries and territories.

54. Effective adaptation planning and the inclusion of ITK within the planning process may be preceded by research agendas that identify specific areas of priority and are targeted at addressing the specific circumstances of indigenous peoples and local communities. For example, Australia's National Climate Change Adaptation Research Plan (NARP) for

¹³ Cape Verde NAPA available at <<http://unfccc.int/resource/docs/napa/cpv01.pdf>>.

¹⁴ Mauritania NAPA available at <<http://unfccc.int/resource/docs/napa/mau01e.pdf>>.

Indigenous Communities identifies the research that is needed to enhance understanding of climate change adaptation for the Aboriginal and Torres Strait Islander peoples of Australia, with the aim of identifying important gaps in current knowledge about those communities' vulnerability and capacity to adapt to climate change. Unlike the country's other NARPs, which focus on sector-specific activities, this one recognizes the cross-sectoral approach needed when considering the risks and vulnerability and adaptive capacity of Aboriginal and Torres Strait Islander communities in relation to the impacts of climate change, as well as the factors that contribute to successful or ineffective (e.g. maladaptive) adaptation responses by and for those communities (Langton et al., 2012).

55. The Swinomish Climate Change Adaptation Initiative in the United States of America is a long-term and community-specific project that comprehensively considers adaptation options, from strengthening community infrastructure and services to increased reliance on traditional community management techniques (Nakashima et al., 2012). A core component of the initiative is the link between community resilience and cultural sovereignty, underpinned by a "foundation of community wellness that encompasses more than the physical health actions to include community cohesion, food security, ceremonial use, knowledge transmission and self-determination" (Swinomish Indian Tribal Community, 2010).

5. Cross-cutting practices and tools

Mainstreaming guidelines, guidance, obligations and protocols

56. The historical context of marginalization of many of the groups that have ITK systems has led countries to address them through standard-setting agreements that assist nations in their goal of fostering enabling environments for effective development and adaptation action. International agreements, protocols and guidelines that concern indigenous peoples and local communities are considered in discussions on ITK on the environment. Some instruments are presented in box 5. Key related issues revolve around ensuring the free, prior and informed consent of communities and their participation in decision-making that has an impact on their livelihoods and resources.

Box 5
A selection of international guidelines and conventions relevant to the use of indigenous and traditional knowledge for adaptation

- Convention No. 169 on Indigenous and Tribal Peoples (International Labour Organization 1989)
- Convention on Biological Diversity (The United Nations Environment Programme 1992)
- Convention to Combat Desertification (The United Nations Environment Programme 1992)
- Convention for the Safeguarding of the Intangible Cultural Heritage (The United Nations Educational, Scientific and Cultural Organization 2003)
- Convention on the Protection and Promotion of the Diversity of Cultural Expressions (The United Nations Educational, Scientific and Cultural Organization 2005)
- International Treaty on Plant Genetic Resources for Food and Agriculture (The Food and Agricultural Organization of the United Nations 2001)
- Universal Declaration on Cultural Diversity (The United Nations Educational, Scientific and Cultural Organization 2001)
- Universal Declaration on Bioethics and Human Rights (The United Nations Educational, Scientific and Cultural Organization 2005)
- United Nations Declaration on the Rights of Indigenous Peoples (2007)

57. In addition, protocols and guidelines exist to promote a respectful and appropriate interaction between researchers, scientists and holders of ITK. The assessment and planning processes that underpin adaptation action, the integration of scientific processes involved in climate change assessments, and the interplay between communities and external development planners, whether they be governments, the private sector or NGOs, provide the basis for the benefits that can be realized from a review of guidance tools and their integration into adaptation processes. Such tools suggest concrete ways to address the upstream issues of participation, equity, respect and benefit-sharing, issues that run the risk of being ignored in rapid planning processes. Many of the guidelines emanate from three primary sources: intergovernmental negotiations; the research and academic community; and indigenous peoples and local communities themselves. The Akwé: Kon guidelines, in particular, provide voluntary guidance on ensuring the full and effective participation and involvement of indigenous and local communities in development exercises as well as the incorporation of traditional knowledge as part of environmental, social and cultural impact assessment processes. The Tkarihwaié:ri Code of Ethical Conduct is also particularly relevant as it advocates the use of ethical principles and methods to ensure that ITK is equally valued and considered alongside science. Methods promoted by the Tkarihwaié:ri Code include negotiations in good faith, subsidiarity and decision-making, partnership and cooperation, gender considerations, full and effective participation/participatory approach, confidentiality and reciprocity.

58. With regard to the use of ITK in relation to climate change adaptation, it is useful to point out that the holders have rights over the use of their knowledge, especially when that knowledge is sought or accessed by external or third parties.¹⁵ Rights to knowledge may be subject to additional layers of complexity as ITK may be held communally by the people or by individuals in the community. Furthermore, there are aspects of a society or peoples' knowledge that might be sacred or secret, whether it is held by the community or an individual. Right to knowledge is articulated in Article 31 of the United Nations Declaration on the Rights of Indigenous Peoples (see box 6).

Box 6

Article 31 of the United Nations Declaration on the Rights of Indigenous Peoples

Article 31 elaborates the rights of indigenous peoples to their traditional knowledge, such as to their sciences, cultures and human and genetic resources, as well as their right to develop intellectual property over such knowledge. The full text reads:

Indigenous peoples have the right to maintain, control, protect and develop their cultural heritage, traditional knowledge and traditional cultural expressions, as well as the manifestations of their sciences, technologies and cultures, including human and genetic resources, seeds, medicines, knowledge of the properties of fauna and flora, oral traditions, literatures, designs, sports and traditional games and visual and performing arts. They also have the right to maintain, control, protect and develop their intellectual property over such cultural heritage, traditional knowledge, and traditional cultural expressions.

Source: United Nations General Assembly. 2007. United Nations Declaration on the Rights of Indigenous Peoples. A/RES/61/295.

¹⁵ The World Intellectual Property Organization Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore is undertaking text-based negotiations with the objective of reaching agreement on a text (or texts) of an international legal instrument (or instruments) which will ensure the effective protection of traditional knowledge, traditional cultural expressions and genetic resources.

59. At the international level, the establishment of policies and guidelines provides a framework in which to engage ITK holders and provides an approach whereby institutions and planners could mainstream the various rights associated with the implementation of projects and programmes that use ITK. Implementers can achieve the twin goals of promoting an enabling environment for the inclusion of ITK and also ensuring the participation of groups that are often marginalized in decision-making, so as to safeguard against unintended violations of basic human rights, including the collective rights of indigenous peoples. Since the establishment of the United Nations Declaration on the Rights of Indigenous Peoples, many United Nations agencies and multilateral funding entities, in line with Article 42 of the Declaration, have accelerated their work on establishing policies on engaging with indigenous peoples. In particular, the Food and Agriculture Organization of the United Nations (FAO), IFAD, UNDP, the United Nations Environment Programme, the World Bank, the Global Environment Facility (GEF) and the Asian Development Bank have dedicated policies and guidelines that seek to establish a mutually respectful dialogue with indigenous and local communities. Other agencies, including UNESCO, are in the process of establishing such a policy. This has notable implications for the work on indigenous knowledge and adaptation as, collectively, those agencies are responsible for financing and/or implementing a significant portion of the adaptation activities at the supranational level. Finally, the newly established IPBES, which embeds recognition of and respect for the contribution of indigenous and local knowledge to the conservation and sustainable use of biodiversity and ecosystems as a key operating principle, is in the process of establishing appropriate procedures and approaches for the inclusion of indigenous and local knowledge within IPBES and its programme of work. At its first plenary, governments considered the initial note on the “Consideration of initial elements: recognizing indigenous and local knowledge and building synergies with science” and decided to implement an expert workshop on the matter, including the participation of indigenous peoples and local communities. The outcomes of the workshop included recommendations relating to understanding the fundamental aspects of local and indigenous knowledge and principles for engagement with indigenous and local knowledge holders. Box 7 contains some key messages from the workshop that are relevant to understanding some basic issues with regard to approaches for the inclusion of ITK in adaptation.

Promoting the complementarity of science and indigenous and traditional knowledge, with respect for local diversity and worldviews

60. Effective adaptation planning requires, beyond access to the best available knowledge, including ITK, an explicit emphasis on understanding the scope and nature of the knowledge of the community concerned. There is a growing need for policies and actions that foster the co-production of new knowledge sets, based upon collaborative efforts and direct exchanges involving community-based knowledge holders and natural and social scientists. Within the domain of natural resource management, co-management regimes that bring communities and the State together have provided an important arena for the development of knowledge co-production (Freeman and Carbyn, 1988; Inglis, 1993; and Kofinas, 2002, as quoted in Nakashima et al., 2012). Knowledge co-production illustrates a dynamic between external researchers and indigenous peoples and local communities. Recognizing knowledge as a dynamic process, knowledge co-production brings knowledge holders together to build, address and engage in knowledge generation. Knowledge co-production emphasizes prior attention to building trust between the two groups as well as respect for areas that should not be researched. In scientific assessment processes, engaging in knowledge co-production can ensure the formal inclusion of ITK, not only as a separate component but also embedded within other parts of the assessment, providing an avenue for exchange between researchers (or assessors) and ITK holders.

61. Though there are synergies between ITK and science, with complementary methods for empirical observation and validation, they remain different systems of knowledge, rooted in different conceptual frameworks. Approaches and tools, therefore, should be grounded in a basic understanding of the diversity of ITK systems, in order to avoid inappropriately subjecting ITK to scientific systems of validation and evaluation.

62. To overcome that barrier, some indigenous peoples are piloting methodologies for data gathering and assessments that are rooted in their own values and that seek to incorporate their own ways of learning and knowing about the world. The emergence of such methodologies is a relatively new phenomenon, with most still in an emergent stage, and they respond to the inability of scientific tools to take into account specific indigenous customs and worldviews. The Center for World Indigenous Studies (Ryser, 2012) proposes data gathering and evaluation techniques that include “visioning, observing, waiting, dreaming, counting, comparing, measuring, interpersonal validation, marking time, metaphor, memorizing with documentary aids, using story, repetition and relational reasoning”. Similarly, the Indigenous Peoples’ Biocultural Climate Change Assessment Initiative (2011) promotes local assessments rooted in understanding and supporting resilience to enhance *buen vivir*, the Andean proposal for a way of life or development that is rooted in the principles of ‘reciprocity, balance and complementarity between human beings and nature’. In Tonga, a research project on understanding local observations of climate change (Lutui, as quoted in the United Nations Educational, Scientific and Cultural Organization, 2013) adopted local conventions for information exchange and knowledge sharing, referred to as *Nofo* and *Talanoa*. For example, by using *Talanoa*, the facilitator documents climate change information while remaining fully aware of Tongan cultural values and beliefs of sharing and giving, and typical Tongan transactions of discussion, including their non-verbal communication cues.

Box 7

Relevant key messages from the international expert and stakeholder workshop entitled “The Contribution of Indigenous and Local Knowledge Systems to the Intergovernmental Platform on Biodiversity and Ecosystem Services: Building Synergies with Science”

In relation to developing procedures and approaches for the inclusion of indigenous and traditional knowledge (ITK), the report on the workshop includes the following messages, highlighting the diverse and holistic nature of ITK:

- There is a need for a diversity of approaches that understand, respect and are adapted to local values, norms, customs and taboos;
- Rigorous translation of words and concepts is important as nomenclature and taxonomy is embedded in indigenous languages;
- The complementary and differential nature of women’s knowledge needs to be taken into account, as well as recognition that such knowledge may only be accessed by certain persons in many societies;
- Knowledge related to the environment may be framed by spiritual and non-material relationships between human and non-human beings and so procedures and approaches must be able to respectfully accommodate both indigenous and scientific worldviews.

Source: Thaman R, Lyver P, Mpande R, Perez E, Cariño J and Takeuchi K (eds.). 2013. *The Contribution of Indigenous and Local Knowledge Systems to IPBES: Building Synergies with Science*. Intergovernmental Platform on Biodiversity and Ecosystem Services Expert Meeting Report, The United Nations Educational, Scientific and Cultural Organization /The United Nations University. Paris: UNESCO. p. 49.

Enabling recognition and participation of indigenous and traditional knowledge holders

63. To ensure the inclusion of ITK, the full and effective participation of ITK holders is a prerequisite. Participation can be facilitated through the mainstreaming of principles, however, it is useful to note different issues that specifically relate to the participation of indigenous peoples and local communities, as well as ITK holders. In an initial guide on principles and procedures being developed for IPBES, the following basic requirements are suggested for the full engagement of ITK holders:

- (a) Recognizing indigenous peoples as knowledge holders;
- (b) Establishing mutual trust and respect;
- (c) Involving indigenous and local knowledge in all assessment phases, from conception through to outputs;
- (d) Recognizing resource owners/users and knowledge holders;
- (e) Involving appropriate local intermediaries and leaders;
- (f) Ethical approaches;
- (g) Free, prior and informed consent;
- (h) Benefit-sharing.

64. Recognition and participation have been enabled in some national-level processes. In 2007, New Zealand held 13 regional consultation *hui* (assemblies) with Maori in order to discuss the issues and options proposed in national documents on climate change. The process enabled Maori to express “their own values and unique *kōrero* (discussions) in relation to the problems and opportunities in their own regions. This included Maori concepts and values, such as recognition of the importance of *kaitiaki* (custodianship) as a core element of New Zealand’s response to the challenge of climate change” (Ministry for the Environment of New Zealand, 2007). The Indigenous Health Adaptation to Climate Change project is a “multi-year, transdisciplinary, community-based initiative working with remote indigenous populations in the Peruvian Amazon, Canadian Arctic and Uganda to examine vulnerabilities to the health effects of climate change and develop an evidentiary base for adaptation”.¹⁶ Ethical principles and protocols were developed early in the project and will also create health adaptation leaders within the community. Indigenous knowledge on health will be stored in an indigenous knowledge bank. The Torres Strait Regional Authority, in partnership with the Torres Strait Islands Regional Council and relevant local, Queensland and Commonwealth government agencies, had been undertaking investigations into the impacts, risks and adaptation options on islands at most risk from sea level rise. Framed within the context of the ‘traditional owners’ right to self-determination’, science, local knowledge and communication of the outcomes of the research came together to provide the communities with options. As a result of the research process, “community understanding of climate change adaptation significantly shifted”, enabling the community to examine a range of options beyond just fortification as a response to coastal erosion (Langton et al., 2012). The result further noted a caution that if “governments expect other indigenous communities to take part in a similar adaptation process, whereby they are recognized as active partners in the investigation, evaluation and informed decision-making about climate change adaptation options, the responsible government agencies first need to ensure that they have the mechanisms in place to address the implementation of adaptation in a reasonable and timely manner. The consequences of failing to address these implementation issues will be considerable. Communities will feel disempowered and potentially lose faith in not only the adaptation process, but also other environmental

¹⁶ See <<http://ihacc.ca/ethics>>.

projects. Ultimately, this may result in the breakdown of mutually beneficial partnerships” (Langton et al., 2012).

C. Current trends, gaps and recommendations

65. There is now a growing awareness that ITK has significant contributions to make within the climate change adaptation process, from observation and assessment to planning and implementation. This entire area of work, however, is new and only beginning to become the focus of dedicated efforts. New, both because climate change adaptation itself is a rich and rapidly developing field of theories and practice, and also because the articulation of ITK and adaptation was only initiated some 10 years ago and only began in earnest in the last five years. For that reason, the domain of ITK and climate change adaptation, even though it holds great promise, requires as yet considerable investigation, experimentation and negotiation. Figure 2 presents a summary of current trends and gaps in the use of ITK for adaptation, as well as emerging needs to address some of those gaps and to further realize the added value of bringing ITK into climate change adaptation processes in an appropriate and mutually-agreed-upon manner.

66. Owing to the emerging nature of the area of work, major gaps persist and need to be addressed in order to benefit from the added value of bringing ITK into climate change adaptation processes in an appropriate and mutually-agreed-upon manner. The initial development of guidelines on the mobilization of ITK across all components of adaptation could provide decision makers and practitioners with modalities and tools for linking ITK with scientific knowledge and using ITK in adaptation decision-making, recognizing the role of relevant international policies and best practices. Such guidelines could also include the development of ITK-based indicators that contribute to measuring the progress made towards adaptation goals, including those of the UNFCCC. The guidelines could be developed through an ad hoc transdisciplinary expert process that includes the knowledge holders of indigenous peoples and local communities.

Figure 2
Needs and gaps in the use of indigenous and traditional knowledge for adaptation

Observation	Assessment	Planning	Implementation	M&E
<p><i>Current trends and gaps</i></p> <ul style="list-style-type: none"> No regional or national observing systems incorporating indigenous and traditional knowledge (ITK) Some initial work on ITK in climate forecasting in countries in Africa and the Pacific Research by scientists, NGOs and indigenous peoples on local observations of change 	<p><i>Current trends and gaps</i></p> <ul style="list-style-type: none"> Vulnerability assessments used in all regions to incorporate ITK on impacts and coping Some NAPAs acknowledge need for ITK, some advocate documenting and promoting certain forms of ITK. 	<p><i>Current trends and gaps</i></p> <ul style="list-style-type: none"> Few or no regional or national adaptation plans incorporating ITK Local-level initiatives to develop adaptation plans, mostly driven by non-governmental organizations, some by indigenous organizations. 	<p><i>Current trends and gaps</i></p> <ul style="list-style-type: none"> No regional or national level adaptation projects that incorporate ITK Community-based adaptation projects in developing countries, mainly since 2005. 	<p><i>Current trends and gaps</i></p> <ul style="list-style-type: none"> No monitoring and evaluation of adaptation projects that incorporate ITK
<p><i>Needs</i></p> <ul style="list-style-type: none"> Systemization of ITK research and a common database Pilot work on national observatories on forecasting and other similar areas based on ITK 	<p><i>Needs</i></p> <ul style="list-style-type: none"> Development of methodologies to fully understand linkages between ITK and adaptation 	<p><i>Needs</i></p> <ul style="list-style-type: none"> Robust methodologies to understand linkages between ITK and climate change 	<p><i>Needs</i></p> <ul style="list-style-type: none"> Further analyses needed to understand the extent of incorporation of ITK in community-based adaptation projects and future implications 	<p><i>Needs</i></p> <ul style="list-style-type: none"> M&E using ITK indicators built into adaptation projects.
<p>Cross-cutting practices and tools (e.g. participation, rights, gender)</p>				
<p><i>Current trends and gaps</i></p> <p>Few tools or approaches provide an explicit approach to all cross-cutting practices</p>				
<p><i>Needs</i></p> <p>Common approaches or policies could be developed (as being developed in IPBES) to provide guidance and understanding on how to mainstream ITK issues into climate change adaptation.</p>				

IV. Application of gender-sensitive approaches and tools for understanding and assessing impacts, vulnerability and adaptation to climate change

A. Introduction

Box 8

Chapter summary

- Overall it is recognized that women are disproportionately affected by climate change, owing to gender inequality in access to resources and decision-making and a number of other livelihood factors. In order to ensure coherent and continuous attention to gender sensitivity throughout the adaptation process, it is critical to have gender strategies and plans outlining key stakeholders' agreements and commitments on how to achieve gender-sensitive outcomes.
- Gender-sensitive climate change adaptation requires continuous attention to gender aspects in all components of climate change adaptation initiatives: assessments of climate change impacts, vulnerability and adaptation options; planning and designing adaptation initiatives; implementation; monitoring and evaluation; creation of an enabling environment and leadership; and project and programme management for specific and time-bound climate change adaptation initiatives.
- There are a number of gender-sensitive tools and approaches, such as gender analyses, vulnerability assessment and gender-disaggregated information systems, and comprehensive gender guidelines and toolkits to promote gender sensitivity in climate change adaptation. While such tools are critical in all phases of the adaptation process, they are primarily being applied during the planning and design of adaptation actions.
- The most prominent approaches to promoting gender sensitivity in climate change adaptation initiatives are gender analysis and participatory approaches. Such approaches, however, are generic and generally implemented according to the specific context and availability of resources. The review highlighted the importance of creating an enabling environment for gender-sensitive adaptation initiatives through advocacy for policy interventions, the translation of guiding principles from international agreements and national policies into operation actions, and the development of national and regional gender strategies for climate change adaptation initiatives.
- There is very limited experience in the application of monitoring and evaluation tools for assessing the gender sensitivity of adaptation projects and programmes. Moreover, there is still no clear guidance on how to develop gender-sensitive indicators at all levels of adaptation projects. It is recommended, therefore, to develop a framework for monitoring gender sensitivity at different stages of the adaptation process.
- There is also a need for: more research into the linkages between successful adaptation and the consideration of gender sensitivity; greater emphasis on explicit gender considerations in all phases of the adaptation process; the development of gender-sensitive resilience frameworks for adaptation initiatives; and better understanding of applying available gender-sensitive approaches and tools in the adaptation context.

67. Gender-based inequalities in relation to resources, livelihood opportunities and decision-making are defining the differences in women and men's vulnerabilities to climate change impacts (see box 9 for definitions). However, gender-based vulnerabilities are highly context-specific, both in time and space. Increasingly, policy frameworks are providing the basis for the gender-sensitive planning and implementation of climate change adaptation efforts and there are a growing number of concrete practices for gender-sensitive impact and vulnerability assessments as well as planning and implementation.

Box 9

Definitions of gender, gender mainstreaming and gender-sensitive approaches

'Gender' refers to the characteristics of men and women defined by society in contrast to the biologically determined ones (that is XX vs. XY chromosomes) or sex. Definitions of gender are therefore based on what society believes men and women can and should do, which is based on deep-rooted values. According to the Economic and Social Council of the United Nations, gender mainstreaming is "the process of assessing the implications for women and men of any planned action, including legislation, policies and programmes, in all areas and at all levels. It is a strategy for making women's as well as men's concerns and experiences an integral dimension of design, implementation, monitoring and evaluation of policies and programmes in all political, economic and social spheres". The ultimate goal is gender equality.

'Gender-sensitive approaches and tools' for understanding and assessing impacts, vulnerability and adaptation to climate change refer to methodologies and practices applied to ensure that both men and women's concerns, aspirations, opportunities and capacities are taken into account in all climate change adaptation activities, including assessments, planning, implementation, monitoring and evaluation and technology development.

Despite the increasing attention being paid to gender and the official recognition of the concepts, there remains great confusion about the meaning of the terms. For instance, equal presence of women and men is often used as a key or sole indicator for 'gender equality' in various initiatives, while information on opportunities, power relations, equal voices, etc. is lacking.

1. Context

68. The imperative of gender equality¹⁷ and women's empowerment to achieve the overall goals of human rights and sustainable development is recognized in the large body of international agreements, including Agenda 21 from the 1992 Earth Summit on Environment and Development,¹⁸ which mentions that "women should be fully involved in decision-making and in the implementation of sustainable development activities" (United Nations, 1995). Likewise, the Beijing Platform for Action¹⁹ adopted at the Fourth World Conference on Women (in Beijing in 1995) states that governments are committed to a new development paradigm integrating environmental sustainability with gender equality and

¹⁷ For many decades there has been an ongoing debate about the terms 'equality' versus 'equity'. In its publication *Gender, Climate Change and Health*, the World Health Organization, for instance, suggests that equity is different to equality. In health, gender equality refers to men and women having the same chances and opportunities to benefit from health programmes and policies. Gender equity moves beyond equal opportunities to consider the different and unequal needs and barriers affecting men's and women's health status and access to health care. This technical paper uses the term 'equality' in line with the Beijing Platform for Action (1995) and subsequent decisions of the Economic and Social Council of the United Nations on gender mainstreaming (2005).

¹⁸ Agenda 21 available at < sustainabledevelopment.un.org/content/documents/Agenda21.pdf>.

¹⁹ See < www.un.org/womenwatch/daw/beijing/platform/plat1.htm>.

justice in line with Agenda 21; while the Millennium Declaration and the United Nations Millennium Development Goals²⁰ include strong commitments to gender equality. The need to accelerate the commitments to gender equality and women's empowerment is also recognized in the outcome document of the Rio+20 United Nations Conference on Sustainable Development (United Nations, 2012).

69. The evolution of gender considerations in international agreements has created an enabling environment for concrete gender-sensitive actions at the regional and national levels, as shown in some examples below, although there are still challenges involved in the full inclusion of gender considerations in national adaptation planning and practices.

70. The Secretariat of the Pacific Community, for example, has recently published a series of gender-mainstreaming assessments in its member States as stocktaking of national capacities for gender mainstreaming and needs for capacity development.²¹ The assessments identified a wide range of commitments that Pacific Island governments have made to achieve gender equality. The national-level gender assessments showed that gender equality and gender awareness are highly context-specific, both in time and space, and defined by a complex network of interrelated social, economic and cultural factors, and expressed, inter alia, in general perceptions about women and men's roles and responsibilities. The assessment for Papua New Guinea, for instance, showed that, while the majority of women are engaged in subsistence livelihoods and play a major role in food security and the economic survival of their families, their contribution is rarely recognized and they are rarely systematically targeted in development activities (Braun, 2012b). (see box 10 for lessons learned on enabling environments in Pacific Island countries).

Box 10

Lessons learned on enabling environment requirements for gender mainstreaming

- Legal and policy framework: the extent to which gender equality and mainstreaming commitments are in place by virtue of ratification of relevant international human rights treaties, the existence of constitutional and legislative provisions and the existence of government policy mandates.
- Political will: demonstrated political will means that action is taken on stated gender-equality commitments and action is formalized within systems and mechanisms to ensure mainstreaming is sustainable.
- Organizational culture: the extent to which the attitudes of staff and institutional systems, policies and structures support or marginalize gender equality as an issue.
- Accountability and responsibility: the ways in which action on commitments to gender mainstreaming can be traced and monitored within organizations, and the mechanisms through which individuals at different levels demonstrate gender equality related results.
- Technical capacity: the extent of skills and experience that organizations can draw on to support gender and human rights mainstreaming initiatives across and within their operations and programmes.
- Adequate resources: the allocation and application of human and financial resources in relation to the scope of the task of mainstreaming.

Source: Braun T (ed.). 2012a. *Stocktake of the Gender Mainstreaming Capacity of Pacific Island Governments: Cook Islands*. Secretariat of the Pacific Community. Available at <<http://www.spc.int/images/publications/en/Divisions/Hdp/cook-islands-gender-stocktake.pdf>>.

²⁰ See <<http://www.un.org/millenniumgoals/>>.

²¹ For more information, see <<http://sids-l.iisd.org/news/spc-publishes-gender-mainstreaming-assessments/>>.

71. Political will and leadership combined with support from international agencies have led to the integration of gender or references to gender in adaptation policies in Arab countries, including Bahrain, Egypt and Jordan (Verner, 2012). Still, the two adaptation projects in Jordan analysed by Schalatek et al. (2012) showed limited gender sensitivity, with weak gender analysis and gender information in general. Some observations on types of gender responsiveness of policies and programmes are highlighted in box 11.

Box 11

Lessons learned on assessing types of gender responsiveness of policies and programmes

The World Health Organization (WHO) has developed a series of general gender-analysis tools, including the Gender Responsive Assessment Scale, for the analysis of policies and programmes:

- Gender-unequal: perpetuates gender inequality by reinforcing unbalanced norms, roles and relations; privileges men over women (or vice versa); will often lead to one sex enjoying more rights or opportunities than the other;
- Gender-blind: ignores gender norms, roles and relations; by ignoring gender aspects, gender-blind programming will often reinforce gender-based discrimination;
- Gender-sensitive: considers gender norms, roles and relations; does not address inequality generated by unequal norms, roles or relations; indicates gender awareness, although often no remedial action is developed;
- Gender-specific: considers gender norms, roles and relations for women and men and how they affect access to and control over resources; considers women and men's specific needs and might intentionally target and benefit specific groups of women or men to achieve certain policy or programme goals or meet certain needs;
- Gender-transformative: considers gender norms, roles and relations for women and men and that they affect access to and control over resources; considers women and men's specific needs; addresses the causes of gender-based health inequities; includes ways to transform harmful gender norms, roles and relations; includes strategies to foster progressive changes in power relationships between women and men.

Source: WHO. 2011. *Gender mainstreaming for health managers: a practical approach*.

Geneva: WHO. Available at <http://www.who.int/gender/documents/health_managers_guide/en>.

2. Gender-sensitive approaches to the adaptation process

72. Overall, it is recognized that women will be disproportionately affected by climate change, owing to gender inequality in access to resources and decision-making and a number of other livelihood factors. A substantial body of literature on gender inequality in the sectors most vulnerable to climate change has emerged over the past decades (Schalatek and Burns, 2013). Research has particularly highlighted women's critical role in natural resource management, including disaster risk management, food processing, water, household energy, and family care in both urban and rural environments, all sectors that are directly affected by climate change but where gender inequality leaves women more vulnerable than men to climate change. For instance, in Nigeria women provide 60–79 per cent of the rural labour force, but men are five times more likely to own land and benefit from services such as credit and extension, thereby increasing their adaptive capacities (British Council and UKaid, 2012). According to the IPCC Fourth Assessment Report, it is exactly gender inequalities with regard to access to wealth and resources that define women's vulnerabilities to climate change impacts in natural resource management (Adger

et al., 2007). But women and men also play different roles in other economic sectors that are threatened by climate change and where gendered impacts and vulnerabilities have been observed. In Jamaica, for instance, women dominate the tourism industry, which, together with agriculture, is the economic sector most hit by climate change in that country (Planning Institute of Jamaica, 2012).

73. There are two major sets of justifications for the need for gender-sensitive approaches to climate change responses. First, each individual is entitled to the same opportunities to influence and benefit from adaptation investments irrespective of gender roles. Secondly, involving only part of the population would be ineffective. For instance, if female stakeholders are not properly consulted when adaptation programmes or projects are being designed, important needs would not necessarily be detected and addressed and the effectiveness of the programmes would be jeopardized. Likewise, important information could be ignored. Activities of the Association of Village Leaders in Suriname, for instance, build adaptation projects on women's unique knowledge of the risks of invasive species for agricultural productivity, which is information that only women have (WEDO, 2013). And for the preparation of an adaptation project in Djibouti, female agropastoralists recommended the development of microfinance, cooperatives and specialized training for women to improve adaptation efforts (UNDP, 2012a). Moreover, it should be noted that greater gender equality is also smart economics, improving productivity and other development outcomes and thereby increasing household and community resilience and thus adaptive capacity (World Bank, 2011a).

74. While research on gender and climate change impacts highlights women's higher vulnerability to climate change impacts compared with men's, research has also shown that the social expectations of men make them more vulnerable to certain forms of climate change impacts. In a recent publication on gender in health adaptation to climate change prepared by the World Health Organization (WHO, 2012), for instance, it was noted that in Australia and India male rural farmers are more likely to commit suicide in the wake of severe drought. On the other hand, a study on gender dynamics and climate change in rural areas of the Plurinational State of Bolivia showed that "men see a dramatic increase in their workload during natural disasters, while women more often see increases because of incremental, slow onset climate changes, in addition to natural disasters" (Ashwill et al., 2011).

75. Finally, it should be noted that the dynamic and context-specific nature of gender roles might cause disconnects between policy and legal frameworks and the actual situation on the ground if continuous attention to gender roles is not institutionalized. In the project document for an adaptation project in Madagascar, it is stated that there are no legal constraints to the access of women to land (The United Nations Environment Programme, 2011). Consequently, no special arrangements were made to ensure women's participation in the preparatory activities for the project. However, recent research on land issues in Madagascar carried out under the Land Coalition showed that statutory laws about women's equal access to land are little known at the community level. Rather, customary practices imply that women do not always enjoy their full rights to land tenure and many women perceive that land "is men's business" (Ramaroson et al., 2010). It is hence critical to apply gender-sensitive and participatory approaches and tools when assessing vulnerability, impacts and adaptation to climate change.

3. The status of gender-sensitive approaches to climate change responses, including adaptation

76. The Cancun Agreements²² include the importance of gender equality and the participation of women in all aspects of climate change responses, including adaptation. The references to gender, mobilization and participation of women and empowerment became more prominent throughout the decisions and in related texts, including in the technical guidelines for national action plans (NAPs).²³ Moreover, a decision of the Conference of the Parties (COP) on the NWP included a request for an expert meeting on ITK and gender-sensitive approaches.²⁴ Decision 23/CP.18, recently adopted, focuses on women's representation in UNFCCC negotiations.

77. The new funding instruments for climate change adaptation stipulate that projects and programmes would incorporate gender-sensitive approaches, indicating a turning point in the implementation of climate change response activities. The governing instrument²⁵ for the Green Climate Fund, for instance, mandates a gender-sensitive approach both in the operation of the fund and as a criterion for the funding of adaptation and mitigation activities. Likewise, there is an increasing focus on gender considerations in the majority of the 49 NAPAs²⁶ developed between 2004 and 2009 and in the 29 projects and programmes recently approved by the Adaptation Fund,²⁷ with many NAPAs aiming explicitly at gender equality and including specific programmes to strengthen capacities in gender analyses and gender-sensitive programming, implementation and M&E. One of the identified barriers to the limited gender mainstreaming in the NAPAs was the insufficient engagement of national gender experts (Verner, 2012). In a recent study of gender-responsive multilateral adaptation investments in the Middle East and North Africa (MENA) region, Schalatek et al. (2012) analysed 32 'adaptation-relevant'²⁸ active projects funded by major multilateral funders.²⁹ According to the study, almost one third of the projects were gender sensitive, while 53 per cent lacked consideration of gender issues. The study found that national projects were generally more gender sensitive than regional projects. Box 12 shows gender consideration in climate change adaptation and development activities.

²² See <<http://unfccc.int/meetings/6005>>.

²³ Decision 5/CP.17, annex.

²⁴ Decision 6/CP.17.

²⁵ Decision 3/CP.17, annex.

²⁶ NAPA project database available at <<https://unfccc.int/4583>>.

²⁷ Adaptation Fund project/programme database available at <https://www.adaptation-fund.org/funded_projects>.

²⁸ Defined by applying the Organisation for Economic and Co-operation and Development (OECD) climate change Rio markers.

²⁹ The World Bank, the African Development Bank, the Climate Investment Funds, the Adaptation Fund and the GEF.

Box 12

Lessons learned on the intersection between climate change adaptation and development activities and the sectoral focus

To understand the specificity of adaptation activities, the analysis of 135 adaptation efforts in developing countries was carried out. The efforts can be categorized as follows:

- Approaches addressing vulnerability drivers, for instance the distribution of goals to women in a development programme in Uganda;
- Building response capacity, for instance reviving women's traditional pastoral management in the United Republic of Tanzania;
- Managing climate risk, for instance teaching women disaster risk management through training in Honduras;
- Confronting climate change, for instance reducing the physical impacts of floods on houses.
- Overall, the analysis showed that:
 - There is a strong intersection between development and adaptation;
 - A total of 90 per cent of the adaptation efforts have a rural focus and address agriculture, disaster risk management and water resources;
 - A total of 45 per cent of the adaptation efforts are implemented at the community level, while relatively few aim at changes at the national level.

Source: McGray H et al. 2007. *Weathering the Storm: Options for Framing Adaptation and Development*. Washington D.C.: World Resources Institute.

B. Review of the application of gender-sensitive approaches and tools for understanding and assessing impacts, vulnerability and adaptation to climate change

78. This section looks at concrete tools and approaches that have been identified as effective in gender-sensitive climate change adaptation initiatives, including vulnerability and impact assessments. The majority of the 32 projects funded by the Adaptation Fund, for instance, focus on the rural sector, including agriculture, food security and water resource management. This follows naturally from the identification of countries' most vulnerable sectors. For instance, vulnerability and adaptation assessments reported by MENA countries in their national communications identified water and agriculture as the most vulnerable sectors to climate change (Schalatek et al., 2012).

79. The ultimate goal of applying gender-sensitive tools, approaches and best practices in climate change adaptation initiatives, including vulnerability and impact assessments, is climate-sensitive adaptation outcomes. While there is still very limited research showing that gender-sensitive approaches in all phases of climate change adaptation will lead to better adaptation, preliminary analysis, such as that carried out recently by Schalatek et al. for MENA countries, highlights the importance of integrated approaches; that is, gender sensitivity within all components of climate change adaptation. The components of a gender-sensitive integrated climate change adaptation initiative are:

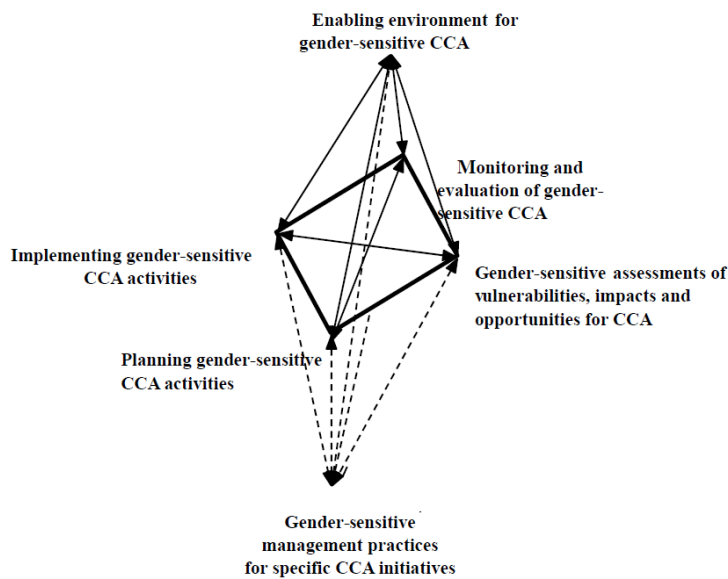
- (a) Gender-sensitive assessments of climate change vulnerability and impacts and opportunities for climate change adaptation actions;

- (b) Planning and design of gender-sensitive climate change adaptation initiatives, including identification of concrete actions, inputs and resources and responsible actors;
- (c) Implementation of gender-sensitive climate change adaptation activities;
- (d) M&E of the gender sensitivity of climate change adaptation activities;
- (e) Creation of an enabling environment and leadership for gender-sensitive climate change adaptation;
- (f) For specific and time-bound climate change adaptation initiatives, the management of gender sensitivity throughout the initiatives.

80. The review of best practices and lessons learned in this section is categorized according to 11 different types of tools and approaches (see the table). The application of the different types of gender-sensitive tools and approaches needs to be seen in the context of an integrated adaptation approach. For that purpose, the following analysis framework was used (see figure 3). It is an adapted version of the adaptation pyramid framework developed by Verner (2012). The foundation of the pyramid consists of the four major steps of climate change adaptation initiatives. The steps are closely interrelated and should be institutionalized as continuous activities of overall climate change adaptation efforts. Moreover, to ensure coherent and continuous gender sensitivity throughout the adaptation initiatives, a management component has been added for specific and time-bound adaptation efforts.

Figure 3:

Analysis framework for the application of gender-sensitive tools, approaches and best practices for adaptation process



Source: Adapted from Verner (2012).

Abbreviation: CCA = climate change adaptation.

Overview of analysed gender-sensitive approaches and tools understanding and assessing impacts, vulnerability and adaptation to climate change

<i>Steps of adaptation process</i>	<i>GS assessments of V&I for CCA action</i>	<i>Planning GS CCA activities</i>	<i>Implementing GS CCA activities</i>	<i>Monitoring and evaluation of GS CCA initiatives</i>	<i>GS management practices for specific CCA initiatives</i>	<i>Creating an enabling environment and leadership for GS CCA</i>
Approaches and tools						
General tools						
Vulnerability assessments	X	X	X	X	X	X
Gender guidelines and toolkits	X	X	X	X	X	X
Gender information systems	X	X	X	X	X	X
General approaches for gender-sensitive assessments, planning and monitoring and evaluation						
Gender analysis	X	X	X	X	X	X
Participatory approaches	X	X	X	X		
Specific practices						
Empowerment of women	X	X	X	X		
Assessment of gender responsiveness				X	X	X
Advocacy for policy action		X	X	X	X	X
Translating guiding principles into operational policies and programmes					X	X
Gender strategies and plans				X	X	X
Gender budgeting					X	X
Capitalizing on institutional capacity	X	X	X	X	X	X

Abbreviations: CCA = climate change adaptation, GS = Gender-sensitive, V&I = Vulnerability, impact and opportunities.

1. General tools

81. This section reviews major tools and approaches for gender-sensitive assessments of vulnerabilities and impacts, including vulnerability assessment tools, gender guidelines providing integrated packages for the planning, preparation, implementation and M&E of gender-sensitive adaptation activities, and gender-disaggregated information systems.

Vulnerability assessments

82. The gender-sensitive tools and approaches for vulnerability assessments identify the vulnerabilities of different socioeconomic groups, including women, and identify why they are vulnerable. The review of tools and approaches for assessments of gender-based vulnerability to climate change showed that comprehensive tools for participatory and gender-sensitive vulnerability assessments exist and are applied successfully in the context of climate change responses.

83. Over the years, there have been challenges linked to the lack of clear definitions of vulnerability and hence difficulties in comparing vulnerability across studies, over time and even in interpretations of vulnerability assessments within specific studies or assessments. Moreover, while definitions of vulnerability keep evolving to accommodate the use of the approach in increasingly complex contexts, vulnerability frameworks are still mainly based on the assumption of a linear relationship between hazards and impacts. However, conceptually it has long been established that social-ecological systems are complex and characterized by non-linearity (Miller et al. 2010, Tousignant and Siouni, 2009). Recent years have seen an increasing use of resilience frameworks for analyses of social-ecological systems vis-à-vis external factors such as climate change. So far, more systematic resilience analysis frameworks have been developed, particularly in the context of disaster risk management. Gender-sensitive vulnerability assessments in terms of input requirements remain to be a challenge (see box 13 for lessons learned on gender-sensitive vulnerability assessments).

Box 13

Lessons learned on gender-sensitive approaches to vulnerability assessments

- Gender-sensitive approaches should be followed during research, design, data collection, data analysis, reporting and, ultimately, programme planning.
- This requires an explicit sensitivity to the varying needs of men and women. It is therefore crucial to involve men and women at all stages of the research, and to sensitize enumerators and other research team members to gender issues relevant to the context in which a study is being conducted.
- Assumptions concerning the relationship between gender and vulnerable groups are inappropriate prior to the analysis of the particular context under study and run the risk of introducing bias into the research design.

Source: World Food Programme. 2009. *Comprehensive Food Security and Vulnerability Analysis Guidelines*. Rome: World Food Programme.

84. According to Ribot (2009), two major models form the basis for how vulnerability is considered and analysed in climate change contexts: (a) the risk-hazard model, where multiple outcomes result from a single climate event, such as a drought; and (b) social constructivist models, analysing single outcomes such as loss of livelihood for social groups such as women as a result of multiple causes, for instance climate events and market fluctuations. Most vulnerability assessment frameworks are based on the social constructivist models, typically using livelihoods or entitlement frameworks, which facilitate a gender-sensitive approach.

85. In development and emergency response contexts, vulnerability analysis frameworks have been used for the last couple of decades, particularly in the context of food security. The World Food Programme (WFP), for instance, has developed the framework of Comprehensive Food Security and Vulnerability Analyses (CFSVA) (see box 14), which is carried out on a regular basis in countries with WFP programmes. The principles of CFSVAs have been integrated into the design of various adaptation initiatives, including an adaptation project in Ecuador focusing on food security and climate change resilience, with cross-sectoral approaches and gender mainstreaming as key strategies (WFP, 2011). The project is being implemented by WFP, which applied existing vulnerability assessments for activity planning within the project. The applied vulnerability assessment framework addresses the following factors: capacity to confront, adaptive capacity, exposure, sensitivity and adjustment time. All of those factors are gender dependent and have been analysed using sex-disaggregated data. The availability of sex-disaggregated indicators is facilitated by the collaboration with the Integrated System for Social Indicators in Ecuador (SIISE), which has a special database with indicators on women and gender, which has facilitated the adaptation project in Ecuador (WFP, 2012). While SIISE is certainly a good practice and critical for the quality of the vulnerability assessment in the Ecuadorian adaptation project, obtaining sex-disaggregated data is still a huge challenge for most sectors and in most countries in the world.

Box 14

Application of the framework of Comprehensive Food Security and Vulnerability Analyses developed by the World Food Programme – an example of best practice^a

- Assists in understanding household and community vulnerability, in particular local strategies to cope with food insecurity
- Shows how gendered division of labour and decision-making power are related to food security and how interventions can be effectively targeted at both men and women and used to promote gender equality
- Analysis based on desk reviews combined with household surveys as well as community focus group discussions and includes sex-disaggregated data, for instance on coping strategies of both female- and male-headed households
- Typical data to be mapped include hazards and other shocks, such as extreme weather hazards and climate change

Source: World Food Programme. 2009. *Comprehensive Food Security & Vulnerability Analysis Guidelines*. Available at <http://documents.wfp.org/stellent/groups/public/documents/manual_guide_proced/wfp203208.pdf>.

86. Other organizations have developed special assessment tools for climate change vulnerability. The handbook developed by CARE International (Dazé e et al., 2009) suggests a framework for analysing the socioeconomic aspects of vulnerability to climate change, with a focus on groups normally marginalized from adaptation-relevant decision-making, including women. Through participatory approaches, the methodology allows the use of community members' own experience and perceptions about vulnerability and their adaptation capacities. Moreover, the approach allows the identification of the enabling environment for community-based climate change adaptation. The approach recognizes that gender plays a critical role in how different groups of people experience climate change impacts. Combining participatory assessments with the facilitation of gender-sensitive experts, the approach allows the identification of gender-differentiated vulnerability and adaptation capacities. The climate vulnerability and capacity analysis framework has been applied in different contexts in Africa, Asia and Latin America and the Caribbean, which

resulted in two key findings: the tool was useful to enhance understanding of socioeconomic and gendered vulnerability to climate change; and the tool was considered time-demanding of its participants, constituting a special challenge for women's participation.

87. CARE International has assembled its publications on community-based adaptation methodologies and experience on a special website, including translations into English, Spanish, French and Portuguese of toolkits, etc.³⁰ Many other organizations follow similar translation procedures. However, there is still a limited availability of tools in local languages, which can limit their usefulness for many local climate change adaptation initiatives.

88. WHO suggests a vulnerability assessment tool for health interventions based on the Driving Force-Pressure-State-Exposure-Effect-Action (DPSEEA) framework (Ebi K (ed.), 2010). DPSEEA is a causal framework, which has been widely used for health assessments. A review of frameworks used for health indicators for climate change and health vulnerability showed that DPSEEA identifies many different intervention points along the environmental health causal chain and is flexible and adaptable (Hambling et al., 2011). Moreover, the DPSEEA framework is considered to be intuitive. It has been piloted in 15 countries around the world before being finalized and at least 30 countries have used it to conduct their health vulnerability and adaptation assessments thereafter. The assessment tool offers limited but direct attention to gender analysis and should be combined with other tools, such as the WHO guidance on mainstreaming gender in health adaptation to climate change programmes, which provides comprehensive recommendations on how to ensure that a health vulnerability and adaptation assessment is gender responsive (WHO, 2012). It should also be noted that users of the DPSEEA are urged to ensure that special vulnerabilities of groups, such as indigenous communities or women, are considered in the assessment.

89. The limited attention paid to gender issues is also noted in many other vulnerability assessment frameworks that are otherwise considered to be best practices for the design of adaptation activities. The Committee on Engineering and the Environment under the World Federation of Engineering Organizations, for instance, has developed a special engineering protocol to assess climate risks and vulnerabilities of many infrastructure systems in Canada and other countries such as Honduras and Costa Rica in the context of infrastructure adaptation (World Federation of Engineering Organizations, 2013). As with other similar vulnerability assessment frameworks, users are encouraged to apply a participatory approach, paying special attention to women's participation in consultations.

Gender guidelines and toolkits

90. A significant number of gender guidelines and toolkits have been developed that integrate a number of tools and approaches and provide practical guidance on gender analysis, vulnerability assessments, mainstreaming of gender in new activities, and gender-sensitive M&E.³¹ Many of the guidelines and toolkits have been prepared as part of specific climate change projects, for specific regions, or for specific sectors such as agriculture, water or health, while others are of a more general nature. For instance, many of the recently approved projects and programmes under the Adaptation Fund include activities to develop gender guidelines. Most of the guidelines cover similar approaches and practices for promoting gender sensitivity.

³⁰ <<http://www.careclimatechange.org/toolkits>>.

³¹ Many of the gender guidelines and toolkits are available at an online repository managed by the Inter-Agency Network on Women and Gender Equality, available at <<http://www.un.org/womenwatch/ianwge/repository/resources-tools.html>>.

91. In order to strengthen gender analysis and gender mainstreaming, FAO developed Socio-economic and Gender Analysis (SEAGA).³² SEAGA is an integrated package with handbooks and tools for application at different levels, from the field level, through intermediary to the macro level. SEAGA manuals have been developed for specific issues, such as emergency and rehabilitation, livestock and irrigation. The SEAGA approach also forms the basis for a training guide on participatory rural research on the interlinkages between gender and food security in a changing climate (FAO, 2013). The training guide, which was launched in 2012, has been developed on the basis of collaboration between FAO and the research program on Climate Change, Agriculture and Food Security.³³

92. SEAGA has formed the basis for and is used as a complementary tool to other major resource books on gender, such as the Gender in Agriculture Sourcebook (2009) developed by FAO, the World Bank and IFAD (World Bank, FAO and IFAD, 2009). The Sourcebook is primarily targeted at international development agencies, NGOs and national authorities tasked with the design of rural development projects. It is built around 16 modules focusing on specific issues such as gender and food security, rural finance, water, forestry and natural resource management, many with critical synergies with climate change vulnerability and adaptation. The module on natural resource management includes a specific thematic note on gender dimensions of climate change. Other thematic notes in the Sourcebook that are relevant to adaptation include those on: gender and natural disasters; gender dimensions of land and water degradation and diversification; and risk management and preventive action.

93. In recent years, several climate change adaptation projects have developed guidelines on gender mainstreaming and climate change adaptation. The “Building Nigeria’s Response to Climate Change” (BNRCC) (2007–2011) project included research and pilot projects on youth and gender initiatives as a part of strengthening Nigeria’s capacity to deal with the impacts of climate change. Among the key activities of the project was the development of the National Adaptation Strategy. To ensure effective implementation of the project’s gender strategy and promote sustainable gender-sensitive climate change responses, the project developed a toolkit on gender mainstreaming in adaptation initiatives at the community level (BNRCC, 2011a). The toolkit presents the most common outline used for gender guidelines on thematic issues, with modules on:

- (a) Key concepts of gender, highlighting special strategies to promote gender equality, such as the gender equality framework;
- (b) Key concepts of climate change and the links with gender, including the gendered impacts of climate change and the concepts of adaptation and vulnerability;
- (c) Concrete steps on how to ensure gender mainstreaming in climate change work, focusing on advocacy for gender-sensitive climate change responses, research to inform gender-sensitive climate change policies and activities and M&E;
- (d) Tools to ensure gender integration into climate change projects, including gender integration checklists, gender stakeholder analysis and gender monitoring matrices.

94. While it might be argued that the multiplication of gender guidelines, toolkits and checklists within projects and programmes should not be necessary as many already exist, the process of preparing the guidelines could form an important capacity development opportunity in itself. Still, the development of gender guidelines or toolkits calls for specific resources and capacities that might often be limited within projects. For example, in the first progress report on an adaptation project in the Solomon Islands funded by the

³² See <<http://www.fao.org/gender/seaga/seaga-home/en/>>.

³³ The research program is carried out under the international research consortium the Consultative Group on International Agricultural Research (CGIAR).

Adaptation Fund, it was stated that the development of gender guidelines had been delayed due to lack of in-country capacity (UNDP, 2012b). Other projects funded by the Adaptation Fund, such as the “Developing Agro-Pastoral Shade Gardens as an Adaptation Strategy for Poor Rural Communities” project in Djibouti, will rely more on gender and climate change guidelines developed by international organizations, including UNDP (UNDP, 2012b).

95. UNDP launched the guidebook *Gender, Climate Change and Community-based Adaptation* in 2010, which is based on experiences from the UNDP-GEF Community-Based Adaptation Programme (UNDP, 2010). Community-based adaptation initiatives have gained increased attention over the last five years. Community-based adaptation initiatives typically take place in vulnerable communities with limited capacities to initiate effective adaptation. The international development agencies engaged in community-based adaptation have long-standing experience of working with community development activities based on flexible designs and adapted capacity-building. The UNDP gender guidebook follows the general structure for similar gender and climate change guidelines on thematic issues and includes a detailed analysis of how to ensure gender sensitivity in all project phases. Some of the lessons learned from the application of the methodology described in the guidebook are captured in box 15. The suggested activities highlight the importance of integrating gender considerations into all components of adaptation initiatives, including vulnerability and impact assessments, the development and use of gender-sensitive indicators, gender-disaggregated data, capitalizing on women and men’s talents and resources, ensuring women’s equal access to information and other resources, and gender-sensitive budgets.

Box 15

Lessons learned from the application of the gender- and community-based adaptation methodology

The global United Nations Development Programme (UNDP) Global Environment Facility Community-Based Adaptation Programme (2008–2012) piloted gender- and community-based adaptation methodologies in 10 countries. Preliminary lessons learned include:

- Without an express consideration of gender from the very beginning of the project cycle, the choice of adaptation interventions can have unintended gender implications;
- An initial analysis of community dynamics is imperative to determine how to most effectively address gender issues;
- Good facilitation is essential for equitable community participation in discussions and decision-making;
- New techniques and technologies can be useful entry points for overcoming traditional gender barriers;
- Gender considerations must be seen in the light of the various power dynamics within a community;
- Gender-balanced participation is critical in all aspects of project planning and implementation;
- Some partner organizations will need capacity-building in gender mainstreaming;
- Projects can be designed to accommodate women’s traditional roles and responsibilities;
- Gender training can help, but it needs to be easy and accessible.

Source: UNDP. 2010. *Gender, Climate Change and Community-based Adaptation*. New York: UNDP.

96. The United Nations Human Settlement Programme's Cities and Climate Change Initiative seeks to strengthen climate change resilience in small- and medium-sized cities in developing countries through low-carbon growth strategies. To promote gender-sensitive climate change assessments for projects funded by the initiative, a checklist tool supported by a concept note was introduced in 2011 (M'Rabu, 2011). The checklist is based on information from the modules of the initiative itself: (a) initial climate change assessment; (b) follow-up in-depth assessment; (c) development of strategies and action plans; and (d) consolidation, institutionalization and mainstreaming, combined with a gender analysis. For each module, the concept note identifies a range of possible gender-differentiated direct and indirect impacts of climate change to facilitate responses to the checklist questions. The checklist questions should lead to a description of gender roles in the area and the identification of gender-based adaptation capacity and can easily be adapted to similar situations in other cities.

97. The WHO (2012) guidelines provide another example of helping programme managers working in climate change and health adaptation to mainstream gender in all phases of climate change and health adaptation projects. The guidelines serve both as an introduction to the gender perspective of impacts on health in different context and as guidelines for programme developers to ensure gender-responsive climate and health programmes. The guidelines offer various user-friendly checklists, for instance on sources of information necessary for the gender analysis of climate change and health adaptation.

Gender-disaggregated information systems

98. It can easily be argued that the most fundamental approach to gender-sensitive planning and implementation is gender-disaggregated information systems. Without basic information on how many men and how many women participate in different activities or are concerned with certain measures, it is practically impossible to design and implement gender-sensitive activities.

99. There are also some good practices in the development of national statistical systems with a high degree of gender disaggregation. SIISE has a special database with indicators on women and gender, which has facilitated the adaptation project in Ecuador. In West Africa, the Economic Community of West African States adopted a community-wide gender policy in 2005. The gender policy puts increased focus on a more operational structure for gender mainstreaming through the gender management system, with the objective of gender mainstreaming in all programmes and policies. As part of the renewed effort, several member States have prepared special publications with basic statistics disaggregated for women and men.

100. The Adaptation Fund calls for gender-sensitive planning, implementation and M&E of adaptation projects. The guidelines for preparing a project results framework and baseline guidance (Adaptation Fund, 2011a) suggest sex-disaggregated data for a number of data sets, particularly relating to capacity development and training. However, the guidance document also seems to reflect the general lack of sex-disaggregated data, although the guidelines suggest that vulnerable groups be consulted to assess qualitative data. Moreover, the review criteria established by the Adaptation Fund (2011b) for project approval include a requirement that the most vulnerable communities should benefit economically, socially and environmentally and that 'gender considerations' should be presented.

2. General gender-sensitive approaches in climate change adaptation initiatives, including vulnerability and impact assessments

101. This section looks at practices applied to include gender sensitivity during the planning and design of project activities and focuses on participatory approaches as a key

factor in the success of gender-sensitive climate change adaptation assessment, planning, implementation and M&E.

Gender analysis

102. The most fundamental and critical approach to gender-sensitive actions is a gender analysis. The objective of a gender analysis is to recognize the complexities of integrating gender into all future programmes and activities and to identify barriers to gender equality, including ensuring that ongoing activities are gender sensitive (see box 16 for information on gender analysis in the context of integrated water resource management). The use of gender analyses should be formulated as ongoing activities and integrated into all phases of the adaptation process.

Box 16

Information generated from the use of gender analysis tools in relation to integrated water resource management

- Who, by gender, is using natural resources and why
- The impact of such uses on the ecosystem and water resources
- Who, by gender, social group and location, is benefiting from various natural resource uses
- Which uses and users, by gender, are generating negative impacts on water resources, as well as the types of impact and the reasons for their generation
- Who, by gender, is being negatively affected due to water uses in other sectors that affect water for the environment
- The role of institutions, including legal frameworks and policies, in determining gender vulnerabilities and impacts

Source: International Network for Capacity Development in Sustainable Water Management (CAP-NET) and Gender and Water Alliance. 2006. *Why Gender Matters: a tutorial for water managers*. Delft: CAP-NET international network for capacity-building in integrated water resources management.

103. Complex gender analysis frameworks have been developed to understand the underlying factors, including cultural and socio-political traditions. They are typically context specific and the level of detail sought through the analysis depends on the overall objective and resources available. In the adaptation project in South Sumatra on forest fire management, which includes community-based fire management with a focus on gender, a gender analysis framework was developed to identify the involvement of men and women (at four different levels: family, neighbourhood, community and government) in activities that might cause fire, fire prevention, fire responses and rehabilitation and adaptation (South Sumatra Forest Fire Management Project, 2006). In implementing the framework, the project used a participatory rural approach at the village level, facilitated by a research team. The analysis revealed that women did not participate enough in project activities but were motivated to get involved. The results of the gender analysis formed the basis for a gender strategy and the capacity-building of village motivators.

104. In a recent study of gender-responsive multilateral adaptation investments in the MENA region, Schalatek et al. (2012) applied Gender Action’s Essential Gender Analysis Checklist³⁴ to analyse 32 ‘adaptation relevant’³⁵ active projects. The nine points in the

³⁴ Available at <<http://www.genderaction.org/publications/11/checklist.pdf>>.

checklist reveal the extent to which gender-related issues are addressed, covering issues such as gender and human rights, gender equality, gender data, gender in context, gender access, gender and care work, gender reflection in inputs and outputs, and gender impact. The analysis showed that projects that carry out gender analysis throughout the project cycle, from the first assessments through design and implementation, are more likely to achieve gender sensitivity throughout project implementation. The review of the approaches applied in the individual projects highlighted the importance of multidimensional gender analysis, which is the integrated analysis of gender aspects in the social, economic, cultural, political and legal contexts, for instance socioeconomic issues such as literacy rates and community leadership roles.

Participatory approaches

105. The mobilization and involvement of all stakeholder interests is critical for successful gender-sensitive climate change adaptation activities. Participatory approaches also promote mutual learning. But it is important to recognize that the context of climate change adaptation is dynamic and hence the institutionalization of the participatory planning framework is critical, with regular updating of stakeholders and their priorities.

106. The international NGO ABANTU for Development seeks to empower women and men to work together to address gender inequalities in Africa through the application of a participatory and action-oriented approach to its work on women's empowerment and climate change. Community members are actively involved in the selection of project design and the implementation of activities. Combined with sensitizing and training on gender issues, the participatory approach favours women's active participation (WEDO, 2013).

107. Over the years, a multitude of guidelines and tools for participatory approaches have been developed, with increasing attention paid to transformative participation. Such guidelines and tools include specific manuals for climate change adaptation. Within its Development and Climate Change Programme, the World Bank issued a capacity development manual on participatory scenario development approaches for identifying pro-poor adaptation options (Bizikova et al., 2010). The approach provides opportunities to increase the usability of information on climate change impacts when developing adaptation responses and to explore linkages between development, projected climate change and relevant adaptation responses. The manual could be seen as a capacity-building tool to assist in applying scenario development approaches.

108. The United Nations International Strategy for Disaster Reduction (now the United Nations Office for Disaster Risk Reduction) (UNISDR) has assembled around 30 good practices and lessons learned in relation to gender-sensitive disaster risk reduction from Africa, Asia, Latin America, the Pacific and Europe. Lessons learned presented in the first publication in 2007 showed, for instance, the importance of a participatory approach to promote gender equality and give both women and men visibility in the planning of a drought risk management project in Brazil. Based on a thorough stakeholder identification and special attention being paid to the involvement of all sectors, the participatory approach allowed, furthermore, the involvement of sectors that would normally not work together (UNISDR, 2007). UNISDR (2008) published a second collection of good practices and lessons learned in relation to gender-sensitive disaster risk reduction. The second publication put special emphasis on climate change adaptation. Generally, the 14 practices presented were based on participatory needs assessments, analysis and planning, which allowed women and men to participate on equal terms in all phases of the projects, and the participatory approach can be seen as a key success factor across the good practices. The specific methodologies applied for the participatory approaches vary and are context

³⁵ Defined by applying the OECD climate change Rio markers.

dependent. However, the exact methodology seems less important for the success than the adherence to the overall principles of a participatory approach, which are the active participation of all key stakeholders, valuing local knowledge, ensuring an environment in which all will be heard, valuing diversity and working with no predefined solutions.

3. Specific practices for implementing gender-sensitive climate change adaptation initiatives

109. This section looks at experiences with implementing gender-sensitive climate change adaptation initiatives in specific contexts. The identified practices address different critical aspects of an integrated approach to gender-sensitive climate change adaptation initiatives, including the empowerment of women, M&E practices, practices for creating an enabling environment, and good management practices for specific and time-bound climate change adaptation initiatives.

Empowerment of women

110. The empowerment of women to enjoy the same opportunities, outcomes, rights and obligations as men is a critical approach to gender-sensitive strategies in most contexts (see box 17 for a specific reference to the Kenyan context). Empowerment activities can take many forms, including creating an enabling environment and the development of women’s capacities, activities that should not be seen as mutually exclusive but rather as complementary. The right mix will be context specific and depend on the outcome of a gender analysis identifying concrete barriers to gender equality and opportunities to address those barriers.

Box 17
Lessons learned from women’s empowerment to promote gender mainstreaming

The Kenyan indigenous non-governmental organization Womankind applies a range of women’s empowerment activities to improve the adaptive capacity of Somali pastoral women. The lessons learned from the empowerment activities include that:

- Empowerment leads to increased income among women;
- Overall poverty levels are reduced;
- Food security is enhanced.

Source: The United Nations Human Settlement Programme. Available at <http://www.unhabitat.org/content.asp?typeid=19&catid=34&cid=160>.

111. One of the winners of the 2012 Dubai International Award for Best Practices³⁶ was the Kenyan indigenous NGO Womankind Kenya, established by Somali pastoral women to increase women’s civil and political participation, ensure equal access and control over economic resources and end gender-based violence. The organization received the best practice award for its activities to empower women to adapt to a harsh climatic and socioeconomic environment. The empowerment approach includes a comprehensive package of activities, including education and training for civic and political participation, diversification of economic activities to decrease the overreliance on pastoralism and crop production, use of natural and human resources to improve livelihoods, and advocacy to promote social inclusion in policy formulation. Through the empowerment package, the

³⁶ The award is a collaboration between the United Arab Emirates and UN-HABITAT and it recognizes best practices with a positive impact on improving the living environment. Selection criteria include demonstrated positive impact on the poor and disadvantaged and gender equality and social inclusion. More information is available at <http://www.unhabitat.org/content.asp?typeid=19&catid=34&cid=160>.

organization has improved income among beneficiaries and reduced poverty and enhanced food security and thus fostered adaptation to climate change.

112. The following specific practices for empowering women have been successfully applied to ensure gender-sensitive adaptation:

(a) **Developing women's leadership capacities** through training and capacity development to give them confidence in speaking out and controlling meetings in a constructive way;

(b) **Facilitating women's physical presence** at meetings and events. In 2011, the international NGO Oxfam together with AusAID assembled 11 good practices on disaster risk reduction and climate change adaptation in the Philippines (Oxfam, 2011). Among the seven criteria used for the selection of the best practices was one on gender sensitivity in terms of addressing the issues and needs of men and women and boys and girls, highlighting the transformative leadership role of women in disaster risk reduction and climate change adaptation;

(c) **Strengthening women's productive opportunities and capacities**, for instance related to food security and income generation, which involves affirmative action for instance through quota systems to ensure that a certain percentage of women participate in workshops, consultations, demonstration fields, etc. Still, according to the World Bank (2011b) (quoting Agarwal, 2010), affirmative action in Nepal and India, where women's participation in forest committees was set at a level well beyond the critical minimum (around 30 per cent), In an adaptation project in Guatemala, the project document foresees that 50 per cent of the participants in different events should be women (UNDP, 2013);

(d) **Targeting communication** to women, with information addressing their special needs, aspirations and capacities (see box 18 for examples of targeted communication for women in Nepal). In the adaptation project in Guatemala, manuals on new, traditional and ancestral adaptation practices will be translated into local languages to promote women's use of the manuals (UNDP, 2013). Moreover, Conservation International (2008) suggests using the communication networks reaching women. Communication networks are also the focus of the technology transfer strategy of FAO in its food security operations in rural El Salvador;

(e) **Addressing women's workload**, particularly in rural settings, where women and girls are using a substantial amount of time fetching firewood and collecting water, tasks that are becoming ever more time-consuming because of climate change impacts.

Box 18

Lessons learned on effective communication networks for women

The Gender in Community-Based Disaster Management research project revealed that, in Nepal, women felt that the most reliable sources of disaster-related information were their neighbours and communities, while men rely on mass media.

Another study reported that female farmers prefer seasonal climate forecast information to be made available through extension officers or schools rather than on the radio, because they are less able to schedule a fixed time to listen to the radio.

Source: United Nations Centre for Regional Development. 2008. *Gender perspectives in community based disaster management*. Available at <http://www.fire.uni-freiburg.de/Manag/gender%20docs/UNDESA_gender_perspectives_in_community_based_management_2008.pdf>.

Advocacy for policy action

113. Many development organizations working to promote gender equality and gender mainstreaming are carrying out advocacy. To promote the implementation of the United Nations Convention to Combat Desertification, for instance, the UNCCD Secretariat prepared an advocacy strategy on gender in order to mainstream gender in work related to the UNCCD. The actions include the development of key messages based on solid information demonstrating the benefits of mainstreaming gender in sustainable land management (UNCCD Secretariat, 2012).

114. Other advocacy activities to promote gender sensitivity in sustainable development actions include various forms of communication, including policy briefs. The Mary Robinson Foundation on Climate Justice, for instance, prepared a policy brief in 2012 presenting field-based perspectives to policymakers on gender, climate change and access to energy (The Mary Robinson Foundation on Climate Justice, 2012). The policy brief includes key messages from field observations, for instance that “there is a distinction to be made between women’s demand for firewood at the local level to meet household needs and the demand for charcoal, which is predominantly a male income-earning activity”. Responsive policies therefore need to cover issues such as land ownership, land-use management, community forest management and the provision of fuel in the short term until woodlots are mature.

115. Complementary to the 2012 World Development Report, which focuses on gender equality and development (World Bank, 2011a, and World Bank, 2011b), the World Bank issued a policy brief entitled Gender & Climate Change: 3 things you should know (World Bank, 2011c). The key messages are that: women are disproportionately vulnerable to the effects of natural disasters and climate change; women’s empowerment is critical to strengthen climate resilience; and low-emission development pathways can be more effective and equitable when based on a gender-informed approach. The key messages are substantiated with brief case studies from the field.

116. Advocacy efforts of institutions such as the International Union for Conservation of Nature have been partly credited for the efficient political will and leadership in Jordan to promote gender sensitivity in the country’s climate change policy framework. In fact, Jordan became the first country in the Arab region to address the linkages between gender and climate change by creating a programme for mainstreaming gender in climate change efforts in Jordan. Jordan’s strategy and associated plan of action was the first formal national strategy of its kind in the world, and it was approved by the Government and endorsed by the National Women’s Committee, guiding the future policies and positions of all agencies addressing climate change (Jordan, 2012).

Translating the guiding principles of gender equality into operational policies and programmes

117. The guiding principles for the preparation of NAPAs,³⁷ adopted at COP 7, state that NAPAs shall be guided by gender equality. A review of the 49 available NAPAs³⁸ that were prepared between 2004 and 2009 showed that the majority highlight that women participated in the consultations held for the development of the NAPAs.³⁹ Several of the adaptation priority activities presented in the NAPAs address issues linked to women’s gender-specific vulnerability to climate change impacts, such as the increased risk of malaria for pregnant women, women’s workload in being responsible for collecting water

³⁷ Available at <<http://unfccc.int/resource/docs/cop7/13a04.pdf>>.

³⁸ Available at <<http://unfccc.int/4585>>.

³⁹ Several of the plans do not include gender considerations, while others limit gender considerations to general statements about women being more vulnerable than men.

and firewood, and women's role in food production. Many NAPAs also identified gender as a selection criterion for the priority activities. A NAPA project proposed by the Maldives specified that criteria for the selection of priority activities will include the degree to which the empowerment of women is achieved and the degree to which employment opportunities can be increased, particularly for youth and women. Some NAPAs specifically mobilize national gender expertise for the consultations and the implementation of the priority activities. With the guidance of the COP stating that the NAP process shall be participatory and gender sensitive, the technical guidelines for the NAP process prepared by the Least Developed Countries Expert Group include guidance on where in the process gender considerations are particularly important and on how to ensure gender mainstreaming in developing NAPs (Least Developed Countries Expert Group, 2012).

Gender strategies and plans

118. In order to ensure coherent and continuous attention to gender sensitivity throughout the adaptation process, it is critical to have gender strategies and gender plans outlining key stakeholders' agreements and commitments on how to achieve gender-sensitive outcomes.

119. The Pacific Adaptation to Climate Change project is the first major climate change adaptation project in the Pacific region. It was launched in 2009 with activities in 14 countries on coastal zone management, food security and food production, and water resources management. To evaluate the gender responsiveness of the project, a gender assessment was carried out recently, which focused on a wide range of issues, including the enabling environment, available resources and the capacity for gender mainstreaming at all levels.⁴⁰ The assessment involved an extensive literature review, a desk study of project documentation, consultations with key national and regional stakeholders, interviews and surveys of national coordinators, and in-country consultations and site visits in Fiji, Micronesia (Federated States of), Nauru, Palau and Tonga. This led to the need for more evidence to support and advocate for gender mainstreaming in climate change mainstreaming and adaptation in Pacific Island countries and the region as a whole.

120. Gender strategies and plans is also one of the critical success factors for gender sensitivity in adaptation projects in the MENA region identified by Schalatek, Bibler and Little (2012).

121. The BNRCC project in Nigeria provides a gender strategy allowing the integration of gender perspectives into all phases of the climate change project. The strategy was developed around the following elements (BNRCC, 2011a):

(a) Gender assessment: gender assessment of the specific communities involved in pilot projects, which will encourage linkages between community knowledge/practice and research/science;

(b) Commitment to guiding principles: both women and men's views, interests and needs shall shape activities;

(c) Specific project components: gender considerations shall be explicit in the four components of the project (policy development, research projects, pilot projects and communication/outreach);

(d) Broader measures: general project measures such as training and partnerships shall equally mobilize women and men;

(e) Monitoring and evaluation: gender-disaggregated data and gender-sensitive indicators shall be used at all levels.

⁴⁰ See <http://unfccc.int/files/adaptation/nairobi_work_programme/application/pdf/sprep_gender.pdf>.

122. To ensure the implementation of the strategy, the commitments and approaches to gender-sensitive climate change responses outlined in the gender strategy are reflected in the National Adaptation Strategy and Plan of Action on Climate Change for Nigeria (2011), which lays out a series of specific measures, for instance for gender-sensitive research on communities' awareness and vulnerability to climate change and the training of government staff on gender tools and approaches (BNRCC, 2011b).

123. Several of the documents for the projects approved by the Adaptation Fund include provisions for the development of specific gender strategies for project implementation. A project in Argentina aiming at increasing the adaptive capacity of key local institutions and actors in Buenos Aires, for instance, has prepared a gender strategy and an action plan to facilitate equal access to project benefits, outlining, among others, activities to address shortcomings identified in gender-sensitive planning and M&E, such as a baseline and a comprehensive gender analysis.

Assessment of gender responsiveness

124. It is essential to assess the gender responsiveness of M&E to ensure the effective management of adaptation initiatives. The gender strategies and implementation plans generally highlight the importance of M&E and many suggest generic indicators. WHO (2011) proposes a Gender Assessment Tool (GAT) to assess the gender responsiveness of a policy or programme. GAT has been developed as a rapid assessment consisting of 23 'yes' or 'no' questions. It is suggested to use GAT in an action-oriented way. For instance, poor availability of gender-disaggregated data in most developing countries would often lead to a 'no' in answer to a question about reporting on gender-disaggregated information.

Gender budgets

125. Gender-responsive budgeting, or gender budgeting as it is often referred to, is a critical accountability and management tool to ensure that budgets reflect the resources required for needed interventions to address gender-sensitive interventions. However, according to the recent review of 32 adaptation projects in the MENA region, only three projects include at least one gender-sensitive mechanism, such as hiring a gender specialist (Schalatek et al., 2012). A project in Lebanon, for instance, focusing on adaptation measures in the agriculture sector, includes a series of gender-sensitive activities, such as a gender-focused update of the agricultural development strategy and the development of a gender-disaggregated information system (International Fund for Agricultural Development, 2012). The gender component of those activities is indirectly reflected in the budget lines for the gender training of project staff and the hiring of gender facilitators.

126. Under the leadership of the National Economic and Development Authority and the National Commission on the role of Filipino Women (now the Philippine Commission on Women), the national gender and development budget policy was established in the Philippines in 1995. The policy requires all government agencies to allocate at least 5 per cent of their budget to specific gender and development activities both at the central and local government level. The policy addresses both the use of funds from official development aid in terms of funding gender and development activities, and the regular budgets of central and local government agencies. According to a recent review of the gender and development budget policy, the gender and development budget has allowed a number of special activities on gender-sensitive climate change responses, including conferences for women in politics on climate change. According to the review, this has improved the institutionalization of women in decision-making and the identification of gender-sensitive recommendations for climate change responses (Illo et al., 2010). The commitment to gender equality is reflected in the policies and strategies of the National Climate Change Commission, including the National Climate Change Action Plan, calling for developing the adaptive capacities of men and women in their communities and the

reduction of risks to women in relation to climate change. However, at the project level, the attention paid to gender sensitivity is less evident. The Department of Environment and Natural Resources issued in 2012 a collection of best practices for climate change adaptation (Corazon (ed.), 2012). The practices were submitted by 100 organizations representing civil society, the private sector, public administration, academic institutions and international organizations. While many of the best practices described in the compilation include activities to foster women's economic empowerment, limited attention is given to gender in the description of the best practices. Overall, the experience of the Philippines underlines general experiences with gender budgeting, namely that it requires special skills at all levels, that it is a slow process, and that it requires strong and continued leadership.

127. The United Nations Entity for Gender Equality and the Empowerment of Women (UN Women) maintains a repository with resources on gender-sensitive budgeting, primarily for public expenditure.⁴¹

Capitalizing on institutional capacity and partnerships

128. While lack of gender-sensitive planning and implementation in projects and programmes can often be explained by a lack of skills and resources, it is also generally recognized that there is a large amount of untapped resources and capacities for gender mainstreaming and the gender-sensitive planning and implementation of development projects. Many of the good practices for gender-sensitive climate change adaptation are based on use of institutional gender capacity and partnerships with specialized agencies.

129. In addition to human resources, many agencies have developed generic and specific gender guidelines and other tools to promote gender equality. Many projects implemented by UNDP under the Adaptation Fund will use the UNDP guidebook (UNDP, 2010). For instance, the project in Solomon Islands aimed at climate-resilient agriculture and food security will use the guidelines for the project's gender analysis, gender mainstreaming and development of gender-disaggregated data (UNDP, 2011). In Guatemala, the Indigenous Women Advocacy Council, which is a public institution, will provide technical support for the design and implementation of the gender-sensitive approach suggested in a project that aims at reducing vulnerability to climate change and climate variability through the design and implementation of a comprehensive strategy to strengthen the social and ecological resilience of production landscapes (UNDP, 2013).

130. The mandate for organizational gender-mainstreaming strategies has led to the development of human capacities in gender mainstreaming, and most international development and humanitarian agencies will have gender experts that can be deployed to provide expert input to different projects and programmes. Many adaptation projects and programmes make use of institutional gender capacities as a practice to enhance gender sensitivity. In addition to the use of in-house capacity, partnerships with other agencies are also used as a good practice. For instance, as part of the adaptation project in Ecuador funded by the Adaptation Fund, the implementing agency, WFP, does not only rely on its own resources of gender-sensitive approaches to vulnerability assessments and project planning and implementation (WFP, 2011). In order to promote the project's key strategy of gender mainstreaming, a partnership was established with UN Women. The partnership has allowed the development of the gender-mainstreaming strategy, which includes training and awareness-raising in relation to gender-sensitive approaches for all stakeholders, which is based on a deeper analysis of the interaction between women and climate change. Moreover, the project will establish other partnerships with other organizations for the implementation of other planned gender activities, including the preparation of a gender baseline.

⁴¹ <<http://www.gender-budgets.org>>.

C. Current trends, gaps and recommendations

131. There is an abundance of tools for vulnerability assessments and gender-sensitive climate change responses. Many new adaptation initiatives apply tools and guidelines, often to comply with the requirements of funding agencies. However, there is still a noticeable amount of new adaptation projects and programmes that pay very limited, if any, attention to gender responsiveness. So far, there has been limited attention paid to linking successful adaptation with gender sensitivity. Such analyses would be important to promote gender-sensitive climate change adaptation, including vulnerability and impact assessments.

132. The majority of tools and approaches for gender-sensitive adaptation focus on the preparatory assessment and planning phases, while a limited number of practices can be identified for M&E. Moreover, there is still no clear guidance on how to develop gender-sensitive indicators at all levels of adaptation initiatives.

133. Many organizations carry out informal user surveys to test the usefulness and applicability of their tools, but without necessarily covering the initiatives that do not apply tools and guidelines. There is a need for systematic assessments of why certain tools and approaches are not applied. The assessments should furthermore address the communication issue, for instance to assess if the distribution of the tools is adequate.

134. Most organizations offer tools and guidelines for gender-responsive activities in major languages such as English, French and Spanish, which in many cases is sufficient as the target groups are project and programme managers. However, there is still a large group of local programme and project staff who would benefit from translations into local languages.

135. With the increased attention paid to resilience in climate change adaptation initiatives, there is a need for the development of frameworks for resilience assessments and the development of indicators. The frameworks should be explicitly gender sensitive, including gender-sensitive indicators.

136. While many general vulnerability assessments used in climate change contexts highlight the importance of gender responsiveness and encourage the use of complementary tools for general gender considerations, there is a need for more concrete approaches as to how to ensure gender sensitivity in all phases of vulnerability assessments.

137. While participatory approaches are widely used for gender-sensitive planning, they do not often provide specific guidance on how to ensure the participation of women in consultations, or on the effectiveness of participation by women.

138. Overall, gender equality is recognized as an important goal. However, the exact meaning of the concept of gender is not always well understood when implementing adaptation initiatives. Often, at the field level the attention paid to gender or women is often reduced to a numerically equal representation of men and women. The gender concept requires constant attention, with regular awareness-raising and training.

139. Some adaptation projects have successfully developed gender strategies and action plans. However, the vast majority of adaptation initiatives do not have specific gender strategies. There is a need for guidance on how to develop gender strategies and action plans and how to apply them, with the provision of frequent updates.

140. Gender budgets are not used in a systematic manner in adaptation projects. There is a need for more guidance on gender budgets, including on their use as an effective gender-sensitive management tool.

141. While there is increased understanding that climate change affects all sectors, most tools, approaches and practices for gender-responsive adaptation still focus on marginalized

rural sectors. There is a need for greater understanding of the pervasiveness of climate change impacts on all sectors, all with gender implications.

142. There is generally little understanding of the opportunities and challenges in terms of gender sensitivity in regional initiatives compared with in national and local initiatives, and there is a need for greater understanding of how, for instance, the gender policies and resources of regional organizations can promote gender-sensitive adaptation initiatives at all levels.

143. To strengthen gender-sensitive climate change adaptation, it is recommended to develop a framework for monitoring gender sensitivity in all components of the adaptation process. It is essential that the indicators for the monitoring framework are intuitive and cross-cultural and can be easily understood by general practitioners without specialized gender-related knowledge. Moreover, the monitoring framework should include possibilities for assessing identified barriers to gender-sensitive approaches.

144. To ensure the full consideration of gender sensitivity in climate change adaptation initiatives, it is important to establish clearer links between gender sensitivity and the effectiveness and impact of such initiatives. It is therefore recommended to conduct regular evaluation of the role of gender-sensitive approaches in climate change adaptation initiatives.

V. Conclusions

145. On the basis of what has been discussed above in this paper, this chapter highlights the following key findings from the review and analysis: major challenges associated with the application of indigenous and traditional knowledge and practices, and gender-sensitive approaches and tools for adaptation; and a number of recommendations for addressing those challenges.

146. With the increased attention paid to adaptation in the climate change policy debate, the uneven distribution of impacts and vulnerability between regions and among social groups becomes critical. As such, factors such as livelihood assets, sources of income, class, social status, race, ethnicity, indigenous identity, culture, values, gender and poverty are defining both vulnerability and capacities to adapt to climate change. Much has been said about the lack of attention paid to gender aspects and ITK during the initial phases of the global climate change policy and response agenda. However, as shown in this paper, there is a range of tools, approaches and practices that are being applied in climate change adaptation that seek to promote the use of ITK and gender sensitivity in adaptation.

147. While there is general agreement on the importance of ITK and its relevance to understanding how local communities, including those of indigenous peoples, are affected by and adapt to climate change, it is a newly emerging focus area of research and policy. The review found that, while there was recognition of the role of ITK in adaptation, it was mainly concentrated in the early stages of the adaptation process, primarily observation and assessment. Few tools and practices demonstrate the ability to invest in design and planning and the transdisciplinary approach needed to incorporate ITK. More understanding of the nature of ITK itself, and how it interlinks with climate change impacts and adaptation, needs to be developed before appropriate approaches and tools can be strengthened.

148. Similarly, while there is increased recognition of the need for gender-sensitive tools and strategies for adaptation, practices for gender-responsive adaptation still focus on marginalized rural sectors, and there is a need for greater understanding of the application of such tools, with concrete guidance on enabling adaptation actions. Some of the most prominent approaches to promoting gender sensitivity in climate change adaptation

initiatives, for example gender analysis and participatory approaches, are generic and generally implemented according to the specific context and availability of resources. There is also very limited experience in the application of M&E tools for assessing the gender sensitivity of adaptation projects and programmes. Moreover, there is still no clear guidance on how to develop gender-sensitive indicators at all levels of adaptation projects. It is recommended therefore to develop a framework for monitoring gender sensitivity at different stages of the adaptation process.

149. A special challenge for most development efforts is the need for robust information systems, for planning as well as for M&E. However, information systems are generally weak in terms of disaggregated, timely and scale-relevant data. This has a clear implication for any planning and monitoring of the use of ITK as well as for gender-sensitive climate change adaptation initiatives.

150. To enhance the inclusion of ITK and the application of gender-sensitive strategies and tools in all components of climate change adaptation, including vulnerability and impacts assessments, it is recommended that:

(a) Guidelines on the use of ITK in adaptation be developed and applied. The objective of the guidelines would be to provide decision makers and practitioners with modalities and tools for linking ITK with scientific knowledge and using ITK in adaptation, recognizing the role of relevant international policies and best practices;

(b) Frameworks for monitoring the application of gender-sensitive methodologies be developed and applied for climate change adaptation initiatives. The frameworks should cover the different components of integrated adaptation initiatives, vulnerability and impact assessments, the planning and design of adaptation initiatives, the implementation of adaptation activities, M&E and the enabling environment, in addition to the general management of specific and time-bound adaptation initiatives. The frameworks should be harmonized to the extent possible, highlighting possibilities for synergy between the use of ITK and the application of gender-sensitive methodologies;

(c) National information systems be developed and adapted to the requirements for planning and monitoring the use of ITK and the application of gender-sensitive methodologies for climate change adaptation initiatives;

(d) Platforms be developed that encourage a gender-responsive multi-stakeholder dialogue, including the participation of men and women from indigenous peoples and local communities, on the impacts of climate change and the range of options for adaptation.

Annex I

List of references

- Adaptation Fund. 2011a. *Results Framework and Baseline Guidance*. Washington D.C.: Adaptation Fund. Available at <<http://adaptation-fund.org/sites/default/files/Results%20Framework%20and%20Baseline%20Guidance%20final%20compressed.pdf>>.
- Adaptation Fund. 2011b. *Adaptation Fund Project/Programme Review Criteria*. Washington D.C.: Washington D.C.: Adaptation Fund. Available at <<http://www.adaptation-fund.org/sites/default/files/Review%20Criteria%205.12.pdf>>.
- ACIA. 2005. *Arctic Climate Impact Assessment*. Cambridge: CUP. Available at <<http://www.acia.uaf.edu/pages/scientific.html>>.
- Adger WN. 1996. Approaches to vulnerability to climate change. *Global Environmental Change*. Working Paper 96-05. Norwich: Centre for Social and Economic Research on the Global Environment, University of East Anglia.
- Adger WN, Agrawala S, Mirza MMQ, Conde C, O'Brien K, Pulhin J, Pulwarty R., Smit B, and Takahashi K (2007). Assessment of adaptation practices, options, constraints and capacity. In: ML Parry et al. (eds.). 2007. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press. pp.717–743.
- Ashwill M, Blomqvist M, Salinas S and Ugaz-Simonsen K. 2011 *Gender dynamics and climate change in rural Bolivia*. Washington D.C.: The World Bank.
- Asia Indigenous Peoples Pact. 2012. *Indigenous Peoples and Climate Change Adaptation in Asia*. Chiang Mai: Asia Indigenous Peoples Pact. Available at <<http://ccmin.aippnet.org/ourpublications/article/1064/Adaptation%20and%20Indigenous%20Peoples.pdf>>.
- Asian Development Bank. 2011. *Community-Based Climate Vulnerability Assessment and Adaptation Planning: A Cook Islands Pilot Project*. Metro Manila: Asian Development Bank. Available at <<http://www.adb.org/sites/default/files/climate-change-assessment-coo.pdf>>.
- Berkes F. 2009. Indigenous ways of knowing and the study of environmental change. *Journal of the Royal Society of New Zealand*. 39(4): pp.151–156.
- Berkes F. 2012. *Sacred Ecology*. Third edition. New York: Routledge.
- Berkes F and Jolly D. 2002. Adapting to climate change: social-ecological resilience in a Canadian Western Arctic community. *Conservation Ecology*. 5(2): p.18. Available at <<http://www.consecol.org/vol5/iss2/art18>>.
- Bizikova L, Boardley S and Mead S. 2010. *Participatory Scenario Development Approaches for Identifying Pro-Poor Adaptation Options: Capacity Development Manual*. Washington D.C.: World Bank. Available at <http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2011/01/11/000333037_20110111033711/Rendered/PDF/589060NWP0EACC10Box353823B01public1.pdf>.
- BNRCC (Building Nigeria's Response to Climate Change). 2011a. *Gender and Climate Change Adaptation: Tools for Community-level Action in Nigeria*. Ibadan: Nigerian Environmental Study/Action Team (NEST) Available at <<http://nigeriaclimatechange.org/docs/2011/BNRCC%20Gender%20Toolkit.pdf>>.

- BNRCC. 2011b. *National Adaptation Strategy and Plan of Action on Climate Change for Nigeria*. Available at <<http://nigeriaclimatechange.org/naspa.pdf>>.
- Braun T (ed.). 2012a. *Stocktake of the Gender Mainstreaming Capacity of Pacific Island Governments: Cook Islands*. Secretariat of the Pacific Community. Available at <<http://www.spc.int/images/publications/en/Divisions/Hdp/cook-islands-gender-stocktake.pdf>>.
- Braun T (ed.). 2012b. *Stocktake of the Gender Mainstreaming Capacity of Pacific Island Governments: Papua New Guinea*. Secretariat of the Pacific Community. Available at <<http://www.spc.int/images/publications/en/Divisions/Hdp/png-gender-stocktake.pdf>>.
- British Council and UKaid. 2012. *Gender in Nigeria Report 2012 – Improving the Lives of Girls and Women in Nigeria*. Available at <http://www.britishcouncil.org.ng/files/2012/12/GenderReport_full.pdf>.
- CARE International. 2013. *Joto Afrika: Climate communications for adaptation*. Available at <<http://unfccc.int/7769.php>>.
- Cheek J. 2008. *Indigenous Knowledge and Scientific Data to Improve Climate Change Adaptation Strategies*. Available at <http://www.sciencepoles.org/articles/article_detail/indigenous_knowledge_and_scientific_data_to_improve_climate_adaptation/>.
- Conservation International. 2008. *Incorporating Gender into PHE Strategies: Experiences from Conservation International*. Available at <http://www.conservation.org/Documents/CI_gender_and_conservation_experiences.pdf>.
- Conservation International. 2013. *“Qochas” to harvest water in high mountain ecosystems in the Andean region of the Altiplano, southern Peru*. Available at <<http://unfccc.int/7769.php>>.
- Corazon CPB (ed.). 2012. *Climate Change Adaptation: Best Practices in the Philippines*.
- Crate S. 2011. Climate and Culture: Anthropology in the Era of Contemporary Climate Change. *Annual Review of Anthropology*. 40: pp.175–194.
- Dazé A, Ambrose K and Ehrhart C. 2009. *Climate Vulnerability and Capacity Analysis Handbook*. CARE International. Available at <http://www.careclimatechange.org/cvca/CARE_CVCAHandbook.pdf>.
- Droesch AC, Gaseb N, Kurukulasuriya P, Mershon A, Moussa KM, Rankine D and Santos A. 2008. *A Guide to the Vulnerability Reduction Assessment*. New York: : United Nations Development Programme – Community-Based Adaptation. Available at <http://www.seachangecop.org/files/documents/2008_12_CBA_Vulnerability_Reduction_Assessment_Guide.pdf>.
- Ebi K (ed.). 2010. *Protecting health from climate change – Vulnerability and adaptation assessment*. World Health Organization. Available at <http://www.who.int/globalchange/publications/Final_Climate_Change.pdf>.
- Economic and Social Council. 2005. *Resolution 2005/31*. Available at <<http://www.un.org/en/ecosoc/docs/2005/resolution%202005-31.pdf>>.
- European Institute for Gender Equality. 2012. *Gender Equality and Climate Change*. Vilnius: European Institute for Gender Equality.
- FAO (Food and Agriculture Organization of the United Nations). 2013. *Training guide: gender and climate change research in agriculture and food security for rural development*. Rome: FAO. Available at <<http://www.fao.org/docrep/018/i3385e/i3385e.pdf>>.

Ford J, Pearce T, Smit B, Wandel J, Allurut M, Shappa K, Ittusujurat H and Qrunnut K. 2007. Reducing vulnerability to climate change in the Arctic: The case of Nunavut, Canada. *Arctic*. 60(2): pp.150–166.

Ford JD, Pearce T, Duerden F, Furgel C and Smit B. 2010. Climate change policy responses for Canada's Inuit population: the importance of and opportunities for adaptation. *Global Environmental Change*. 20(1): pp.177–191.

Freeman M and Carbyn L (eds.). 1988. *Traditional Management and Renewable Resource Management in Northern Regions*. Edmonton: Boreal Institute for Northern Studies, University of Alberta.

Gearheard S, Pocernich M, Stewart R, Sanguya J and Huntington HP. 2010. Linking Inuit knowledge and meteorological station observations to understand changing wind patterns at Clyde River, Nunavut. *Climatic Change*. 100: pp.267–294.

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). 2012. *Understanding the interactions between biodiversity, threats and climate change: Vulnerability analysis and strategies for climate change adaptation at conservation sites, the MARISCO methodology*. Eschborn: Deutsche Gesellschaft für Internationale Zusammenarbeit. Available at <<http://www.giz.de/Themen/de/dokumente/giz2013-en-biodiv-marisco.pdf>>.

Hambling T, Weinstein P and Slaney D. 2011. A review of frameworks for developing environmental health indicators for climate change and health. *International journal of environmental research and public health*. 8(7): pp.2854–2875. Available at <<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3155333/>>.

Jordan. 2012. Submission to the Decision 23/CP.18. Available at <http://unfccc.int/files/documentation/submissions_from_parties/application/pdf/cop_gender_jordan_02092013.pdf>.

International Fund for Agricultural Development. 2012. *Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon (AgriCAL)*. Washington D.C.: Adaptation Fund. Available at <<https://www.adaptation-fund.org/sites/default/files/AgriCal%20Revised%20PD%20-%20Final%20-%2022%20May%202012.pdf>>.

International Network for Capacity Development in Sustainable Water Management and Gender and Water Alliance. 2006. *Why Gender Matters: a tutorial for water managers*. Delft: CAP-NET

Illo J.F.I, Encinas-Franco J, Villaseñor J.M.R, Leyesa M.D.L, de los Trino F.C.I. 2010. *Accounting for gender results*. Quezon City: Miriam College, Women and Gender Institute. Available at <http://www.neda.gov.ph/HGDG/presentation/AFGR_Book.pdf>.

Indigenous Health Adaptation to Climate Change. n.d. *Ethics*. Available at <<http://ihacc.ca/ethics>>.

Indigenous Peoples of Africa Coordinating Committee. 2011. *National adaptation platform of indigenous peoples, adaptation policy makers and national meteorological authorities*. Available at <<http://unfccc.int/7769.php>>.

Inglis J (ed.). 1993. *Traditional Ecological Knowledge: Concepts and Cases*. Ottawa: Canadian Museum of Nature/International Development Research Centre.

Ingold T and Kurtilla T. 2000. Perceiving the environment in Finnish Lapland. *Body and Society*. 6(3–4): pp.183–196.

- Indigenous Peoples' Biocultural Climate Change Assessment Initiative (IPCCA). 2011. *IPCCA Methodological Toolkit*. Available at <<http://ipcca.info/toolkit-en-ipcca-methodological-toolkit>>.
- Kofinas G. 2002. Community contributions to ecological monitoring: Knowledge co-production in the US–Canada Arctic Borderlands. In: I Krupnik and D Jolly (eds.). 2002. *The Earth is Faster Now: Indigenous Observations of Arctic Environmental Change*. Fairbanks, Alaska: Arctic Research Consortium of the United States of America. pp.54–91.
- Krupnik I and Jolly D (eds.). 2002. *The Earth is Faster Now: Indigenous Observations of Arctic Environmental Change*. Fairbanks, Alaska: Arctic Research Consortium of the United States of America.
- Langton M, Parsons M, Leonard S, Auty K, Bell D, Burgess P, Edwards S, Howitt R, Jackson S, McGrath V and Morrison J. 2012. *National Climate Change Adaptation Research Plan for Indigenous Communities, National Climate Change*. Gold Coast: Adaptation Research Facility. p.50. Available at <<http://www.nccarf.edu.au/publications/national-climate-change-adaptation-research-plan-indigenous-communities>>.
- Least Developed Countries Expert Group. 2002. *Annotated guidelines for the preparation of national adaptation programmes of action*. Bonn: UNFCCC. Available at <http://unfccc.int/files/cooperation_and_support/lcd/application/pdf/annguide.pdf>.
- Least Developed Countries Expert Group. 2012. *National adaptation plans: Technical guidelines for the national adaptation plan process*. Bonn: UNFCCC. Available at <http://unfccc.int/essential_background/library/items/3599.php?such=j&symbol=FCCE/GEN/288%20E#beg>.
- Liberia. 2008. *National Adaptation Programme of Action*. Available at <<http://unfccc.int/resource/docs/napa/lbr01.pdf>>.
- Mauritania. 2004. *National Adaptation Programme of Action to Climate Change*. Available at <<http://unfccc.int/resource/docs/napa/mau01e.pdf>>.
- Maynard NG, Yurchak BS, Sleptsov YA, Turi JM and Mathiesen SD. 2005. *Space Technologies for Enhancing the Resilience and Sustainability of Indigenous Reindeer Husbandry in the Russian Arctic*. Proceedings of the 31st International Symposium on Remote Sensing of Environment, Global Monitoring for Sustainability and Security, 20–24 June 2005, St. Petersburg, the Russian Federation.
- McGray H, Hammill A, Bradley R, Schipper E.L, and Parry J.E. 2007. *Weathering the Storm Options for Framing Adaptation and Development*. Washington D.C.: World Resources Institute.
- Mearns, R. and Norton, A. 2009. Equity and Vulnerability in a Warming World: Introduction and Overview In: Mearns, R. and Norton, A. (eds.). *Social Dimensions of Climate Change Equity and Vulnerability in a Warming World*. Washington D.C.: World Bank. pp. 1-46.
- Miller F, Osbahr H, Boyd E, Thomalla F, Bharwani S, Ziervogel G, Walker B, Birkmann J, van der Leeuw S, Rockström J, Hinkel J, Downing T, Folke C and Nelson D. 2010. Resilience and Vulnerability: Complementary or Conflicting Concepts? *Ecology and Society*. 15(3).
- Ministry for the Environment of New Zealand. 2007. *Consultation with Māori on Climate Change: Hui Report*. Available at <<http://www.mfe.govt.nz/publications/climate/consultation-maori-hui-report-nov07/index.html>>.

- Government of Nepal, 2011. *National Framework on Local Adaptation Plans for Action*. Government of Nepal, Ministry of Environment, Singhdurbar.
- M'Rabu R. 2011. *City- and national-level climate change assessments: A checklist for mainstreaming gender*. Nairobi: The United Nations Human Settlement Programme.
- The Mary Robinson Foundation - Climate Justice. 2012. *Access to sustainable energy – The gender dimensions*. Policy brief. Available at <<http://www.mrfcj.org/pdf/Policy-Brief-Malawi-Access-to-Sustainable-Energy-the-Gender-Dimensions.pdf>>.
- Nakalevu T. 2006. *CV&A: a guide to community vulnerability and adaptation assessment and action*. Compiled by Taito Nakalevu. Apia: Secretariat of the Pacific Regional Environment Programme. Available at <http://www.sprep.org/att/publication/000437_CVAGuideE.pdf>.
- Nakashima DJ, Galloway McLean K, Thulstrup HD, Ramos Castillo A and Rubis JT. 2012. *Weathering Uncertainty: Traditional Knowledge for Climate Change Assessment and Adaptation*. Paris: The United Nations Educational, Scientific and Cultural Organization.
- National Advisory Board on Climate Change and Disaster Risk Reduction. Government of Vanuatu. 2013. *Traditional Knowledge & Climate Indicators Project*. Available at <<http://www.nab.vu/projects/traditional-knowledge-climate-indicators-project>>.
- Nyong A, Adesina F and Osman Elasha B. 2007. The value of indigenous knowledge in climate change mitigation and adaptation strategies in the African Sahel. *Mitigation and Adaptation Strategies for Global Change*. 12(5): pp.787–797.
- Oxfam. 2011. *Rising to the Call: Good Practices in Disaster Risk Reduction and Climate Change Adaptation in the Philippines*. Quezon City: Oxfam.
- Park A. 2011. Beware Paradigm Creep and Buzzword Mutation. *The Forestry Chronicle*. 87(3): pp. 337–344.
- Parrish AM. 1994. Indigenous post-harvest knowledge in an Egyptian oasis. *In: IK Monitor*. 2(1). Available at <http://maindb.unfccc.int/public/adaptation/adaptation_casestudy.pl?id_project=129&id_hazard=&id_impact=&id_strategy=&id_region=2>.
- Parry ML, Canziani OF, Palutikof JP, van der Linden PJ and Hanson CE (eds.). 2007. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press.
- Pasteur K. 2011. *From Vulnerability to Resilience (V2R)*. Warwickshire, UK: Practical Action. Available at <<http://practicalaction.org/media/view/9654>>.
- Peters-Guarin G and McCall MK. 2010. *Community Carbon Forestry (CCF) for REDD. Using CyberTracker for Mapping and Visualising of Community Forest Management in the Context of REDD. K: TGAL (Kyoto: Think Global, Act Local) Report*. Available at <<http://www.communitycarbonforestry.org/NewPublications/CyberTracker%20MMM%20forest%20carbon%20REDD%20MM,%20GP.pdf>>.
- Planning Institute of Jamaica. 2012. *Enhancing the Resilience of the Agricultural Sector and Coastal Areas to Protect Livelihoods and Improve Food Security*. Washington D.C.: Adaptation Fund. Available at <<https://www.adaptation-fund.org/sites/default/files/Jam%20Proposal%20for%20posting.pdf>>.
- Ramaroson M, Ramiaramanana D and Ravoniarisoa L. 2010. *Promoting women's access to and control over land in the central highlands of Madagascar*. Available at <http://landportal.info/sites/default/files/wlr_1_madagascar_web_0.pdf>.

- Ribot J. 2009. Vulnerability Does Not Fall from the Sky: Toward Multiscale, Pro-Poor Climate Policy. In: R Mearns and A Norton (eds.). *Social Dimensions of Climate Change Equity and Vulnerability in a Warming World*. Washington D.C.: World Bank. pp.47–74.
- Roncoli C. 2006. *Ethnographic and participatory approaches to research on farmers' responses to climate predictions*. *Climate Research*, 33(1):pp 81-99.
- Roncoli C, Crane T and Orlove B. 2009. Fielding Climate Change in Cultural Anthropology. In: SA Crate and M Nuttall (eds.). *Anthropology and Climate Change*. California: Left Coast Press. pp. 87–115.
- Ryser R. 2012. *An Indigenous Scientific Methodology for evaluation*. Center for World Indigenous Studies: Olympia, USA. Available at: <<http://www.cwis.org>>
- Schalatek L, Bibler S and Little S. 2012. *From ignorance to inclusion*. Washington D.C.: Heinrich Böll Stiftung. Available at <<http://www.genderaction.org/publications/ignorancetoinclusion.pdf>>.
- Schalatek L and Burns K. 2013. *Operationalizing a gender-sensitive approach in the Green Climate Fund*. Heinrich Boell Foundation and Global Gender and Climate Alliance. Available at <http://www.boell.org/downloads/Schalatek_Burns_GCF_Gender-Sensitive-Approach.pdf>.
- Swinomish Indian Tribal Community. 2010. *Swinomish Climate Change Initiative: Climate Change Adaptation Action Plan*. Washington D.C.: Office of Planning and Community Development. Available at <http://www.tribesandclimatechange.org/docs/tribes_167.pdf>.
- South Sumatra Forest Fire Management Project. 2006. *Gender-Sensitive Approaches in Community-Based Fire and Natural Resources Management*. Available at <<http://www.fire.uni-freiburg.de/Manag/gender%20docs/SSFFMP-Gender-Brochure-2006.pdf>>.
- Takano T. 2004. Connections with the land: Land skills courses in Igloolik, Nunavut. *Ethnography* 6(4):pp. 463—486.
- Technical Centre for Agricultural and Rural Cooperation. 2012a. *Participatory Mapping and Community Empowerment for Climate Change Adaptation Planning and Advocacy – An Orientation and Project Planning Workshop - 21-26/5/12, Honiara, Solomon Islands*. Available at <<http://pgis.cta.int/ongoing-initiatives/86-pgis-wksp-honiara>>.
- Technical Centre for Agricultural and Rural Cooperation. 2012b. *First Participatory 3D Model built in the Caribbean*. Available at <<http://pgis.cta.int/ongoing-initiatives/112-first-participatory-3d-model-built-in-the-caribbean>>.
- Thorpe N, Hakongak N, Eyegetok S and the Kitikmeot Elders. 2001. *Thunder on the tundra: Inuit qaujimajatuqangit of the Bathurst caribou*. Generation Printing.
- Tousignant M and Sioui N. 2009. Resilience and Aboriginal Communities. *Journal of Aboriginal Health*. 5(1): pp.43–61.
- Uganda. 2007. *National Adaptation Programmes of Action*. Available at <<http://unfccc.int/resource/docs/napa/uga01.pdf>>.
- UNCCD (United Nations Convention to Combat Desertification) Secretariat. 2012. *Advocacy policy framework on gender*. Available at <<http://www.unccd.int/Lists/SiteDocumentLibrary/Publications/gender%20flyer%20web.pdf>>.
- UNDP. 2010. *Gender, Climate Change and Community-based adaptation*. New York: UNDP. Available at <<http://www.undp.org/content/dam/aplaws/publication/en/publications/environment->

energy/www-ee-library/climate-change/gender-climate-change-and-community-based-adaptation-guidebook-/Gender%20Climate%20Change%20and%20Community%20Based%20Adaptation%20(2).pdf>.

UNDP. 2011. *Enhancing resilience of communities in Solomon Islands to the adverse effects of climate change in agriculture and food security*. Washington D.C.: Adaptation Fund. Available at <<https://www.adaptation-fund.org/sites/default/files/SI%20final%20project.pdf>>.

UNDP. 2012a. *Developing agro-pastoral shade gardens as an adaptation strategy for poor rural communities*. Washington D.C.: Adaptation Fund. Available at <<https://www.adaptation-fund.org/sites/default/files/Djibouti%20proposal%20with%20annexes%20final.pdf>>.

UNDP. 2012b. *Enhancing Resilience of Communities in Solomon Islands to the Adverse Effects of Climate Change on Agriculture and Food Security - Strogem Waka lo Community fo Kaikai (SWoCK) - Project performance report July 2012*. Available at <<https://www.adaptation-fund.org/project/1333-enhancing-resilience-communities-solomon-islands-adverse-effects-climate-change-agricul>>

UNDP. 2013. *Climate change resilient production landscapes and socio-economic networks advanced in Guatemala*. Washington D.C.: Adaptation Fund. Available at <https://www.adaptation-fund.org/sites/default/files/PIMS_4386_Guatemala_AF_Full_Proposal_Nov2012.pdf>.

UNFCCC. 2011. *Ecosystem-based approaches to adaptation: compilation of information*. Note by the Secretariat. Available at <<http://unfccc.int/resource/docs/2011/sbsta/eng/inf08.pdf>>.

The United Nations Environment Programme. 2011. *Promoting climate resilience in the rice sector through pilot investments in Alaotra-Mangoro region*. Washington D.C.: Adaptation Fund. Available at <<https://www.adaptation-fund.org/sites/default/files/Final%20to%20post.pdf>>.

The United Nations Educational, Scientific and Cultural Organization. 2013. *Impacts and Adaptations to Climate Change: Observations and Experiences of the Local Community of Lifuka/Ha'apai in the Kingdom of Tonga by Vika Lutui*. Available at <<http://www.climatefrontlines.org>>.

The United Nations Human Settlement Programme. *Dubai International Award for Best Practices (DIABP)*. Available at <<http://www.unhabitat.org/content.asp?typeid=19&catid=34&cid=160>>.

UNISDR (United Nations International Strategy for Disaster Reduction). 2007. *Gender Perspective: Working together for Disaster Risk Reduction*. Geneva: UNISDR. Available at <<http://www.unisdr.org/we/inform/publications/547>>.

UNISDR. 2008. *Gender Perspectives: Integrating Disaster Risk Reduction into Climate Change Adaptation*. Geneva: UNISDR. Available at <http://www.un.org/waterforlifedecade/pdf/2008_isdr_gender_perspectives_disaster_risk_reduction_cc_eng.pdf>.

United Nations Centre for Regional Development. 2008. *Gender perspectives in community based disaster management*. Available at <http://www.fire.uni-freiburg.de/Manag/gender%20docs/UNDESA_gender_perspectives_in_community_based_management_2008.pdf>.

- United Nations. 1995. *Fourth World Conference for Women – Platform for Action*. Available at <<http://www.un.org/womenwatch/daw/beijing/platform/plat1.htm>>.
- United Nations. 2012. *The Future we Want*. Available at <<http://sustainabledevelopment.un.org/futurewewant.html>>.
- United Republic of Tanzania. 2007. *National Adaptation Programme of Action*. Available at <<http://unfccc.int/resource/docs/napa/tza01.pdf>>.
- United Nations University – Institute for Sustainability and Peace. 2013. *Eco-system based adaptation strategies for enhancing resilience of rice terrace farming systems against climate change*. Available at <<http://unfccc.int/7769.php>>.
- Verner D. (ed.). 2012. *Adaptation to a Changing Climate in the Arab Countries*. Washington D.C.: World Bank.
- WEDO (Women’s Environment and Development Organization). 2013. *Information provided to the UNFCCC*. Available at <http://unfccc.int/files/adaptation/nairobi_work_programme/application/pdf/wedoincludeaction.pdf>.
- WFP (World Food Programme). 2009. *Comprehensive Food Security & Vulnerability Analysis Guidelines*. Available at <http://documents.wfp.org/stellent/groups/public/documents/manual_guide_proced/wfp203208.pdf>.
- WFP. 2011. *Enhancing resilience of communities to the adverse effects of climate change on food security, in Pichincha Province and the Jubones River basin*. More information available at <<https://www.adaptation-fund.org/project/1328-enhancing-resilience-communities-adverse-effects-climate-change-food-security-pichincha>>.
- WHO (World Health Organization). 2011. *Gender mainstreaming for health managers: a practical approach*. Geneva: WHO. Available at <http://whqlibdoc.who.int/publications/2011/9789241501071_eng.pdf>.
- WHO. 2012. *Mainstreaming gender in health adaptation to climate change programmes*. Geneva: WHO. Available at <www.who.int/globalchange/publications/Mainstreaming_Gender_Climate.pdf>.
- World Bank, FAO and IFAD. 2009. *Gender in agriculture sourcebook*. Available at <<http://www.ifad.org/gender/pub/sourcebook/gal.pdf>>.
- World Bank. 2011a. *Gender Equality and Development*. Washington D.C.: World Bank.
- World Bank. 2011b. *World Development Report 2012: Gender Equality and Development*. Washington D.C.: World Bank Publications.
- World Bank. 2011c. *Gender & Climate Change: 3 things you should know*. Available at <<http://siteresources.worldbank.org/EXTSOCIALDEVELOPMENT/Resources/244362-1232059926563/5747581-1239131985528/5999762-1321989469080/Gender-Climate-Change.pdf>>.
- World Federation of Engineering Organizations. 2013. *Information provided to the UNFCCC*. Available at <http://unfccc.int/files/adaptation/nairobi_work_programme/application/pdf/wfeo.pdf>.
- Ziervogel G and Opere A (eds.). 2010. *Integrating meteorological and indigenous knowledge-based seasonal climate forecasts in the agricultural sector*. Climate Change Adaptation in Africa learning paper series. Ottawa: International Development Research Centre. Available at <<http://www.idrc.ca/EN/Documents/CCAA-seasonal-forecasting.pdf>>.

Annex II

An explanation of terms

I. Best practices

1. The term “best practices” is used in this technical paper to refer to a practice that, upon evaluation, has demonstrated success in contributing to the goal that it was set out to achieve, and that can be replicated providing that a certain set of predetermined conditions are fulfilled. Closely related terms are ‘lessons learned’, ‘promising practices’ and ‘learning practices’.¹ The identification of a tool or an approach as a best practice would normally need some qualifiers to describe what the objective of that practice is. In theory, the objective of tools and approaches to promote gender sensitivity and indigenous and traditional knowledge would be effective adaptation and/or mitigation. However, many tools and approaches for adaptation initiatives are still in the early stages of implementation and a proper assessment of the effectiveness and efficiency of such tools and approaches would require more rigorous monitoring and evaluation with baselines, etc. Hence, this paper does not make any judgement on the quality of the tools and approaches per se, but tries to highlight practices and tools that have proven to be effective in facilitating the use of indigenous and traditional knowledge and practices as well as gender-sensitive approaches and tools for adaptation, as well as to identify associated challenges.

II. Adaptation and adaptive capacity

2. By the terms “adaptation” and “adaptive capacity”, this paper is referring to the definitions provided in the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.² Adaptation is the adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory, autonomous and planned adaptation. Considering that this paper addresses tools and approaches to improve climate change adaptation initiatives, the focus is on planned adaptation. Adaptive capacity in relation to climate change is defined as the ability of a system to adjust to climate change (including climate variability and extremes), to moderate potential damage, to take advantage of opportunities, or to cope with the consequences.

III. Indigenous and traditional knowledge

3. There are various definitions of indigenous and traditional knowledge, but one commonly accepted working definition refers to such knowledge systems as cumulative bodies “of knowledge, practice and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment” (Berkes, 2012). Chapter II of this document provides a more detailed introduction to the concept and its common definitions.

¹ See: European Institute for Gender Equality. 2011. *Mainstreaming gender into policies and programmes of the institutions of the European Union and EU Member States*. Available at <<http://eige.europa.eu/sites/default/files/Good-Practices-in-Gender-Mainstreaming.pdf>>.

² See <<http://www.ipcc.ch/pdf/glossary/ar4-wg2.pdf>>.

IV. Gender sensitivity

4. This paper uses the term “gender sensitivity” in its generic form to refer to deliberate efforts to ensure that the specific roles, resources, opportunities and voices of men and women are taken into account. Chapter III of this document provides a more detailed introduction to gender and women’s empowerment.
