Submission on UNEP-WCMC's recent work and lessons learned in the area of ecosystems, water resources and adaptation

This submission is made in response to the invitation by UNFCCC SBSTA 44 for Parties, Nairobi Work Programme partner organizations and other relevant organizations to provide information on lessons learned and good practices in the area of ecosystems and water resources to inform adaptation planning and actions.

Background

The United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) works with scientists and policy makers worldwide to place biodiversity at the heart of environment and development decision-making. Based in Cambridge, UK, UNEP-WCMC is a collaboration between UN Environment and the UK charity, WCMC, and has an international team of over 100 experts in conservation and environmental management. UN Environment is a partner of the Nairobi Work Programme, and UNEP-WCMC has actively engaged in Nairobi Work Programme meetings, workshops and reports since 2013.

The content of this submission is informed by UNEP-WCMC's long-standing experience working on ecosystem-based adaptation (EbA). This has involved working with a range of partners including UN Environment, UNDP, IUCN, BirdLife International, IIED and GIZ to support countries in their climate change adaptation planning and implementation.

Key projects of relevance to this submission include:

- The Mountain EbA Programme[1] (2011-2015), implemented with funding from the German Environment Ministry (BMUB) through a partnership of UN Environment, UNDP and IUCN. The overarching goal of the Programme was to strengthen the capacities of governments and local communities in Uganda, Nepal and Peru to reduce vulnerability and increase resilience to the effects of climate change using EbA measures in targeted mountain ecosystems.

- The 'Building Capacity for Coastal Ecosystem-Based Adaptation for Small Islands Developing States (SIDS)'[2] project (short title: Coastal EbA Project), 2014-2016, funded by the European Commission and implemented by UN Environment, together with UNEP-WCMC. This project aimed to strengthen the capacity of governments of Caribbean and African SIDS to incorporate EbA approaches in their national adaptation strategies and plans. A coastal EbA options guide and online decision support tool were developed and training workshops were held in Grenada and the Seychelles. Decision makers were helped to understand future threats to coastal communities and ecosystems, and how governments and civil society can together act to maintain the future health of ecosystems and buffer coastal communities from climate change impacts.

[1] http://adaptation-undp.org/projects/mountain-eba
[2] http://web.unep.org/coastal-eba/

- The 'Ecosystem-based approaches to adaptation: strengthening the evidence and informing policy'[3] project (short title: EbA Evidence Base Project), 2016-2019, implemented as part of the International Climate Initiative (IKI) through a partnership of UNEP-WCMC, IIED and IUCN. This project will assess the effectiveness of EbA approaches, determine the obstacles to their implementation, and influence policy. The project will show when and why EbA is effective, highlighting the conditions under which it works, and the benefits, costs and limitations of natural systems compared to other options, and will promote tools to help integrate EbA principles into policy and planning.

- The project 'Climate-Resilient Communities and Protected Areas'[4] (2012-2016) was implemented by UNEP-WCMC with funding from the MAVA Foundation. The overall goal was to enhance livelihoods and increase socio-ecological resilience in West African marine protected areas (MPAs) to climate change impacts. The project worked closely with local, regional and international partners to: (i) assess the social vulnerability to climate change of natural resource dependent human populations living in and around MPAs; and (ii) to build the capacity of protected area managers and communities to use this information for adaptation measures.

Lessons learned and good practices on adaptation planning processes addressing ecosystems and interrelated areas such as water resources

As the experience of the Mountain EbA Programme and work on tools and methods under the EbA Evidence Base Project have shown, incorporation of ecosystem-related considerations into adaptation planning processes is still often incomplete. It can be promoted by raising awareness among adaptation planners and decision-makers of the crucial role of ecosystem services for climate change adaptation, and the possibility that ecosystems will be affected by adaptation measures such as the construction of dams or the upgrading of irrigation systems. Further, adaptation planners need access to the most appropriate tools and methodologies that facilitate the consideration of ecosystems and their services in the development of adaptation strategies and measures. In order to adequately address ecosystems in adaptation planning processes, the following issues should be taken into account:

- Possible impacts of climate change on ecosystem services that are currently important to human communities (e.g. changes in carrying capacity of pastures);

- Possible impacts of climate change on demand for ecosystem services (e.g. increased demand for regulation of drought and floods);

- Possible impacts of envisaged adaptation measures on ecosystems and their services (e.g. abstraction of lake water for irrigation having an impact on fish stocks).

Under the Mountain EbA Programme, UNEP-WCMC developed a guidance document on Integrating Ecosystem Considerations into Climate Change Vulnerability and Impact Assessment (VIA), which is intended to complement other established VIA methodologies and tools. Some learning points from the VIAs carried out by country teams in Nepal, Peru and Uganda under the Mountain EbA Programme are:

[3] http://www.iied.org/ecosystem-based-approaches-climate-change-adaptation
[4] http://web.unep.org/coastal-eba/content/climate-resilient-communities-and-protected-areas-west-africa

- An appropriate balance is needed between scientific and traditional knowledge and local perspectives; local stakeholders often have particular knowledge of ecosystems in their area, and mechanisms for coping with current climatic variability and change, while scientific assessments are often needed to evaluate potential future impacts of climate change, and the viability of different options to address these.

- The success of adaptation interventions can be enhanced by planning from the outset for an ongoing adaptation process owned by the beneficiaries, including long-term monitoring and evaluation by local stakeholders and relevant government agencies.

The importance of incorporating local knowledge into vulnerability assessments and empowering local stakeholders in the adaptation planning process from the start is also highlighted by lessons learned from the Climate Resilient Communities and Protected Areas project. The project developed a highly participatory, community-based methodology, which it applied at three pilot sites in the Gambia and Senegal. Through the use of this engaging and empowering process, local communities planned and implemented various locally-determined adaptation actions for which they took full ownership. This methodology has been published as the step-by-step guide *Resilience and Adaptation Planning for Communities in Protected Areas*[5], which provides tools for effectively engaging with communities living in, and around, protected areas regarding appropriate strategies to deal with the negative impacts of climate change. This manual outlines a practical and pragmatic community-based resilience and adaptation planning process, offering step-by-step guidance on initiating the planning process, engaging the community in it and refining and implementing action plans. This document provides useful guidance to a wide audience wishing to work with communities to holistically strengthen their resilience to climate change.

The Coastal EbA Project also included the development of practical guidance for managers and planners on *Options for EbA in Coastal Environments*[6]. This guidance provides a broad understanding of the principles and concepts of coastal EBA, as well as a range of different coastal EBA options, and discusses issues and challenges that need addressing in EBA planning and implementation. From the application of this guidance in pilot projects we found that:

- The combination of anthropogenic and climatic threats means that many coastal ecosystems face significant challenges to their long-term viability and resilience. A comprehensive understanding of coastal ecosystems, particularly their wide range of social, economic and biological values and how these contribute to human and ecosystem adaptation to climate change, is an essential first step in planning for the long-term maintenance of these ecosystems and effective adaptation to climate change.

Three key approaches are especially important in underpinning coastal EBA planning processes:

1. making use of existing policies and area-based planning frameworks such as integrated coastal zone management (ICZM) and marine spatial planning (MSP) for delivery of EbA, identifying appropriate entry points for this purpose;

[5] https://www.unep-wcmc.org/news/supporting-climate-resilience-of-communities-in-and-around-protected-areas
[6] https://www.unep-wcmc.org/system/dataset_file_fields/files/000/000/380/original/Options_for_Ecosystem_based_Adaptation_in_Coastal_Environments_low-res.pdf?1462462607

2. integration of EbA with national policy objectives in relevant sectors and international commitments (e.g. under multilateral environment agreements);

3. building on wider national climate change and disaster risk reduction strategies and processes.

The EbA Evidence Base Project is assessing the availability of tools and approaches to support planners and practitioners in the various stages of planning, designing and implementing EbA, and is researching EbA effectiveness. The project partners are preparing an inventory of EbA relevant tools and methodologies, and surveying project partners and stakeholders on capacity and skills for EbA planning and implementation. Initial results from this exercise indicate that:

- there is a large number of these tools and methodologies available (around 170 entries);
- the majority address the early stages of planning (79%), assessment (78%) and design (51%);
- despite the large number of tools available, there remains demand for tools on EbA planning and assessment, suggesting a lack of access to, or awareness of, tools and methodologies;
- only about 20 of the tools and methodologies are produced in a language other than English;
- of these, only 3 have accompanying materials in a non-European language.

Research on EbA effectiveness under this project is in the early stages, but early results suggest that:

- EbA implementation is hindered by a range of social, institutional and capacity issues;
- most notably, the cross-sectoral nature of EbA project planning and management requires cross-sectoral integration and collaboration, which is difficult to achieve;
- other challenges include a lack of financial resources, capacity, technical or knowledge constraints, unclear institutional mandates, or an unsupportive policy environment;
- opportunities are provided by government prioritization, appropriate incentives, strong institutions and a supportive policy/legislative context;
- opportunities for mainstreaming and upscaling EbA are numerous and include incorporating EbA approaches into climate change finance initiatives.

Lessons learned and good practices in monitoring and evaluating the implementation of ecosystem-based adaptation

UNEP-WCMC supported country teams in Peru, Uganda and Nepal in the development of indicators and monitoring approaches for the adaptation interventions implemented under the Mountain EbA Programme. Some results and lessons learned from this work include:

- Indicators related to activities and outputs are easier to define than ones that describe the adaptation impact of an intervention, especially for ecosystem-based adaptation

given that the possible increased resilience of ecosystems and their services to future climatic impacts cannot be measured directly. This challenge can be addressed by:

  - the use of proxies: indicators building on process or structural characteristics of ecosystems that are linked to the desirable functions (e.g. vegetation cover as a proxy for the capacity to retain soils);

  - indicators that measure changes in the capacity to deliver ecosystem services under present conditions (e.g. changes in vegetation productivity or average soil moisture content).

- Indicators related to the condition of ecosystems and ecosystem service delivery need to be complemented with indicators of the ability of human communities to manage ecosystems in an adaptive manner. The latter need to take into account:

  - limitations and thresholds in ecosystem carrying capacities (e.g. indicators related to the establishment of appropriate governance structures or levels of knowledge and understanding related to sustainable ecosystem management);

  - changes resulting from measures that aim to reduce the dependency of communities on a particular service (e.g. through the diversification of livelihood opportunities).

Under the Climate Resilient Communities and Protected Areas project, a monitoring and evaluation guide[7] was developed for the protected area managers, staff and relevant community associations of the pilot areas. The guide focuses specifically on how to monitor the adaptation interventions developed by the communities under the project. Given the technical and financial constraints of the protected area staff and communities, this guide brings together a range of simple methodologies to carry out regular climatic, socio-economic and environmental monitoring and proposes some resource-efficient and practical data-gathering techniques.

The inventory of EbA relevant tools and methodologies currently being prepared by UNEP-WCMC, IIED, IUCN and GIZ shows that there are fewer tools and methodologies addressing monitoring and evaluation (38%) and mainstreaming (11%), compared to stages of EbA such as planning and assessment. Discussions with stakeholders during workshops and events indicate that there is demand for appropriate EbA monitoring and evaluation tools.

Tools for assessing the benefits of mitigation and adaptation to enhancing resilience and emissions reductions that ecosystem-based adaptation provides

(See the previous section for an explanation of UNEP-WCMC's experience of developing approaches to monitoring EbA measures.)

The impacts of EbA measures in terms of emission reductions can be assessed by applying the methodologies developed under a range of initiatives aiming to incentivize land-based mitigation efforts, including REDD+ programmes and certification schemes for voluntary carbon offsets. While methodologies for forest-related carbon accounting under REDD+ are

[7] https://www.unep-wcmc.org/system/comfy/cms/files/files/000/000/774/original/UNEP-WCMC_M_E_Guide_2016_en.pdf

widely known and documented, existing approaches for other ecosystems such as peatlands and grasslands are less well publicized. The report Managing ecosystems in the context of climate change mitigation[8] provides an overview of management practices that can provide both mitigation and adaptation benefits in a range of ecosystem types, and contains some references to available accounting methods.

The guidance on Options for EbA in Coastal Environments[9] developed through the Coastal EbA Project also highlights the additional benefits that may be expected from the application of EbA approaches in coastal environments. These include benefits for mitigation of climate change. For example:

- conserving and restoring mangrove ecosystems may have additional benefits for biodiversity conservation and carbon sequestration storage - mangroves are among the most carbon-rich forests in the tropics, storing an average of 1,000 tonnes of biomass and soil carbon, over double that of upland forests and five times that of savannah (Donato et al. 2012);

- conserving and restoring seagrass habitats can contribute to coastal protection, accrete sediment and raise surface elevation, support fisheries, and offer additional benefits for biodiversity and carbon storage.

Early results from the EbA Evidence Base Project's research component suggests that EbA can deliver a range of benefits in addition to enhancing resilience of ecosystems and communities, though the nature and extent of these benefits, as well as trade-offs between them, require further investigation. Areas lacking evidence include:

- the trade-offs between potential beneficiaries, where benefits are accrued and when;

- the boundaries that influence ecosystem resilience, and the thresholds beyond which ecosystems can no longer provide the key ecosystem services on which people depend;

- the economics and financial aspects of EbA. Evidence varies from site-to-site and is rarely comparable, but in most instances there is evidence to suggest that EbA is perceived as financially viable and economically beneficial, with a multitude of economic co-benefits emerging from project activities, which are hard to quantify;

- the trade-offs about where and when financial/economic costs and benefits accrue;

- specific technical aspects of EbA, for example the contribution of genetic diversity to adaptation, and potential role of certain ecosystems such as riverine fisheries.

This project's inventory of EbA-relevant tools and methodologies also points to a number of key gaps in this area of assessing benefits of EbA, including links to mitigation. For example, there are many tools aimed at helping planners and practitioners design and implement suitable EbA options in a range of ecosystem types and contexts. However, most of the tools profiled are general (i.e. applicable to all ecosystems; 60%), followed by marine and coastal, and urban EbA approaches. Very few entries in the inventory are targeted at other ecosystem types, notably mountains and drylands, suggesting a gap in the availability or accessibility of

[8] https://www.cbd.int/doc/publications/cbd-ts-86-en.pdf
[9] https://www.unep-wcmc.org/system/dataset_file_fields/files/000/000/380/original/Options_for_Ecosystem_based_Adaptation_in_Coastal_Environments_low-res.pdf?1462462607

methodologies for identifying potential benefits and limitations of EbA options tailored for these ecosystems. In addition, out of the 170 entries, only 5 tools explicitly address the planning, design or implementation of both mitigation and adaptation options.

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