

Submission in the area of ecosystems, interrelated areas such as water resources and adaptation under the Nairobi work programme:
Ecosystem based Adaptation in Mountain Ecosystems in Nepal

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A. Description of relevant activities and collaborating partner institutions

The Ecosystem based Adaptation (EbA) Project was piloted in Nepal, Peru and Uganda, aimed to strengthen the capacity of these countries, which are particularly vulnerable to the impacts of climate change. The project sought to build up the resiliency of ecosystems within these countries and reduce the vulnerability of local communities with particular emphasis on mountain ecosystems. The project was funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMUB) - through its International Climate Initiative - and jointly implemented by the International Union for the Conservation of Nature (IUCN), the United Nations Environmental Programme (UNEP) and the United Nations Development Programme (UNDP). In Nepal, the Ministry of Forest and Soil Conservation (MoFSC) / Department of Forests (DOF) were the implementing agency at the national level in partnership with UNDP, IUCN and UNEP while Ministry of Population and Environment (MoPE) played an overall coordination role.

B. Key results

- 54500 plants planted on 65 ha. area of Panchase conserving ecological region, benefitting 2496 households
- 31 natural water sources protected, benefitting 1542 households
- 35 traditional ponds conserved, benefitting 1800 households
- 32 gabion walls and green structures constructed, protecting 1819 households from landslides
- 5 river bank protection activities held in around 180 meter area, benefitting 292 households
- 6 sites of river restored with grey-green infrastructure, benefitting 156 households
- 6 nurseries of Timur and Chiraito planted 46,000 seedlings
- 32 forest fire control and management trainings
- 27 Invasive species management training

Additional results

- Bioengineering demonstration site by conducting broom grass cultivation in the road side to avoid landslides have stabilized the slopes in the interventions sites
- Promotion of agroforestry species has increased the availability of grass and fodder
- Community biodiversity registration has documented the local biodiversity area in the project executed VDCs
- In-situ conservation of important local indigenous species (Cynthea species, Laut salla etc), and biodiversity garden establishment
- Promotion of ecotourism, bee farming, vegetable production, bio gas plant, agroforestry, nursery establishment as livelihood activities
- Integrated soil management

Knowledge products

Range of knowledge products were produced based on learning (policy briefs, manuals, brochure, assessment reports, concept and approaches, good case studies, scientific papers etc). In addition to this local information and center and museum were also established in collaboration with local communities and line agencies.

C. Description of lessons learned and good practices

Approaches:

- Step-wise EbA planning:
 - Participatory assessments played an important part in increasing understanding of what EbA is and what benefits it can provide, and helped to identify early measures that would provide benefits on the ground
 - Participatory assessments preceded VIAs, the latter being more relevant to local and regional decision makers
- Showing socio-economic benefit early on:
 - Through no-regrets measures, e.g. clear economic returns from conservation agriculture and plant products (Ecosystem restoration, sustainable water use and management, integrated soil nutrient management, conservation farming and livestock management, land rehabilitation, livelihood diversification, knowledge management)
 - Because environmental and adaptive benefits are visible only in the longer-term
 - Compromise approaches must be adopted, but more research needs to be done regarding how best to include no-regrets and grey-green measures while avoiding maladaptation
- Adopting a landscape scale approach:
 - Panchase Protected Forest, as a protected area, provided relevant governance structures and plans for planning and implementing EbA at landscape scale
 - Mountain ecosystem: use of a catchment scale was relevant
- Vulnerability impact assessment and identification of potential EbA options: EbA approach outlined science based approach in terms of analysis of climate change impacts and vulnerabilities and integrating traditional indigenous knowledge of communities towards planning and implementing EbA options.
- Despite the uncertainty of climate predictions, climate data gaps, and knowledge, CC impacts can only be planned for a predicted climate scenario and within the boundaries. Working with such scenario enables better, participatory and effective planning process.
- EbA options identified taken account of the local context such as identification of species for land degradation treatment and plantations of degraded lands to ensure sustainability of conservation or management practices.
- Addressing the social-environmental contexts of the vulnerability, which were integrated towards understanding the community context and addressed the vulnerabilities of communities to climate change.
- EbA Policy discussion and engaging with stakeholders:
 - The line ministries, government intuitions, academia, research entities were involved and engaged to provide feedback and enable better policies, mainstreaming effort of the EbA approach. Further, policy discussion in different platforms must be taken into consideration and systematically planned.
 - Necessary to engage a range of policy levels in planning and budgeting for EbA
 - Operationalization of EbA-supportive policies remains dependent on adequate technical and institutional capacities, and financial resources
- Documentation of learning and knowledge generated for wider dissemination

Activities:

- Ecosystem Restoration: broom grass cultivation, plantation of fodder and tree species, green road promotion, Establishment of tea and coffee nursery plantation
- Sustainable Water use and management: Restoration of wetlands, water source and pond conservation, promotion of efficient water use technology
- Integrated Soil Nutrient Management: Integrated plant nutrient management system, improvement of farm yard manure, establishment of biogas, improvement of farm yard manure, soil test and improvement of soil quality, waste management
- Conservation farming and livestock management: promotion of in-situ conservation of indigenous species, Community Biodiversity Registration, Improvement of livestock sheds, promotion of improved cook stove, promotion of organic farming, Bee farming
- Land Rehabilitation: promotion of bioengineering, plantation of broom grass along newly constructed road, community mobilization

- Livelihood diversification: promotion of ecotourism, cultivation of sugarcane, kurilo and vegetables
- Awareness Raising and Capacity building: trainings, workshops and consultation from national to grass-root levels.

Coordination / Institutions:

- Coordination mechanism established at national and regional level ensured greater translation of science, knowledge and practices for localized implementation.
- Building and utilizing the technical expertise of district line agencies was pivotal in implementing along with the local knowledge of the community during planning of interventions. More so, engaging government line agencies fostered partnership for greater ownership of the EbA intervention by the local user groups.

Capacity Enhancement:

- Conceptual clarity and knowledge dissemination on ecosystem based approaches which was critical, conducted at all levels vis-à-vis central, regional, and local including user groups towards planning for ecosystem based climate adaptation interventions. Development of a Comprehensive Capacity Development Plan helped outline key target groups at national, sub-national and local levels.
- Capacity development training provided to engrain the concept, approached and proven practices of EbA among all project staff along with technical staff to ensure clarity and common understanding in terms of implementation of field based activities and ensuring effective monitoring of the EbA activities.
- Considering the previous experience, the frequent partner coordination meeting was very effective in ensuring that each partner took account of their responsibility not only for the respective component but the project as a whole.

D. Description of key challenges

- Mainstreaming the government line agencies at all levels in the EbA interventions, as they need to be integral stakeholder in planning of climate change adaptation options at local levels.
- Capacity building of the Social networks, community based organizations, user groups and women groups effectively so that they internalize and then contribute by implementing EbA interventions
- Harmonization of science based analysis of vulnerabilities of ecosystem and communities and the traditional and indigenous knowledge
- Effective coordination mechanism in place for sustainability
- Complexity of measuring ecosystem change, adaptive capacity and climate change within one project proved challenging

Next page, indicating lessons learned from the Global Mountain EbA Programme, excerpted from:

United Nations Development Program (2015) Making the case for Ecosystem-based Adaptation: The Global Mountain EbA Programme in Nepal, Peru, and Uganda. New York. [http://www.pnuma.org/cambio_climatico/publicaciones/UNDP_\(2015\)-Mt_EbA_report_FINAL2_web_vs\(041215\).pdf](http://www.pnuma.org/cambio_climatico/publicaciones/UNDP_(2015)-Mt_EbA_report_FINAL2_web_vs(041215).pdf)

Participatory assessments increased understanding of the linkages between climate change, ecosystems and livelihoods and thereby enabled a better understanding of EbA and its benefits in the longer term. Framing EbA benefits can be challenging, as the links and causalities between livelihoods, ecosystems and climate change can be complex to understand. In addition, the process of carrying out participatory assessments enabled a sense of ownership and buy-in for identified 'no regrets' measures.

It is essential to show the benefits, and in particular the socio-economic benefits, of EbA to communities early on to make the case for EbA. Having initial 'no regrets' activities that focus on economic benefits, such as promoting alternative livelihoods, or increasing agricultural or livestock production, can help secure commitment. Implementing grey-green water infrastructure measures early on has been another approach to providing tangible and visible environmental and social benefits from the outset.

Once initial benefits of EbA have been shown, the case can then more easily be made for implementing broader, scaled-up EbA measures, which provide a range of benefits in the long term and are essential for enhancing adaptive capacity.

Undertaking vulnerability and impact assessments helps to frame EbA options in a climate change adaptation context. VIAs enabled the validation or redesign of early 'no regrets' measures into evidence-based EbA measures. They also enabled the adoption of a landscape scale approach and long-term planning of EbA measures.

EbA measures provide a range of environmental, social and economic benefits. These include environmental benefits such as enhancing water provision, reducing soil erosion and increasing vegetation. Social benefits include enhanced food security, access to clean water, strengthening of local organizational and technical capacities and empowerment of women and disadvantaged groups. Economic benefits include increased productivity, new sources of livelihoods and increased income.

Benefits derived from EbA measures can be shown in relation to **climate change adaptation functions**. EbA measures can, for example, increase agricultural and livestock production during dry spells, through increased water provision by well managed watersheds. Restoring grasslands can increase provision of grazing and forage during dry periods, regulate water and floods during heavy rainfall and stabilize slopes during landslides.

A watershed or catchment was found to be a particularly good scale for planning and implementing EbA measures. This scale is appropriate in particular when making the case for landscape scale approaches to district level governments and protected area managers. It also ensures the attainment of EbA benefits in a more comprehensive and sustainable manner, especially with regards to ecosystem provision and regulating services.

Building on **existing knowledge** can further embed the benefits of EbA. EbA is a **knowledge-based approach, which requires both scientific and traditional knowledge**.

Incorporating EbA into existing **local structures and plans** can further **make the case on the relevance of EbA benefits** for existing goals and priorities, in addition to strengthening institutional and adaptive capacities to deal with climate change adaptation.

Showing the multiple benefits of EbA to **government planners and policy makers** can show how EbA helps fulfill public policy goals, and can increase interest in implementing EbA measures. This can then lead to incorporation of EbA into relevant governance structures, plans and policies, as well as allocating budgets in relevant sectors, from local to national level.

Measuring impact of EbA is essential, as so far most evidence is case study-based, and more quantitative evidence is needed to make the case for EbA. The development of EbA indicators is in its initial stages.