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THE BENEFITS AND CHALLENGES OF INTEGRATING AN ECOSYSTEM APPROACH IN COMMUNITY CLIMATE ADAPTATION IN TWO LANDSCAPES IN NEPAL

Introduction

This briefing sheet presents lessons on the Hariyo Ban Program's work in Nepal on taking an integrated ecosystem and community approach to climate adaptation in Nepal. Major lessons focus on the value of integrating ecosystems in adaptation; the need to work at different scales and the challenges this poses; the importance of taking a multi-disciplinary approach; and the need to consider different time scales.

The USAID-funded Hariyo Ban Program[1] is working with Government of Nepal and civil society on reducing threats to biodiversity and adverse impacts of climate change on human and ecological communities, in two high-value biodiversity landscapes: Terai Arc Landscape (TAL) and Chitwan-Annapurna Landscape (CHAL), complemented by support to strengthen the enabling policy environment at the national level.

Problem Description

Climate change is affecting people and nature in Nepal, and impacts are increasing as climate change advances and there are more severe weather events. Major adverse effects to date include impacts on agriculture and livestock from unpredictable monsoons and other rains; increased scarcity of water supplies; and increase in certain pests and diseases. There is an increased risk of floods and landslides; Nepal's young and fragile geomorphology with its extreme altitudinal range makes it very vulnerable to climate-induced disasters.

In the longer term, program studies and assessments have projected that there will be major changes to many of Nepal's forests, ecosystem processes and species. Millions of people in Nepal have a very close relationship with their environment and are dependent on natural resources and the services that natural systems provide. Hence as species and ecosystems are affected there will be many consequent impacts for people (through changes in availability of natural resources, and ecosystem services such as water provision, pollination of crops, stabilization of hillsides, and natural disasters). Climate vulnerability of species and natural systems is often exacerbated by non-climate stresses, including high dependency on forest products, new settlement in forests, fire, infrastructure development, illegal hunting and logging, human-wildlife conflict, overgrazing, and invasive species. Their resilience to climate can be enhanced by reducing these non-climate stresses.

Lessons Learned

Integrated ecosystem-community approach

Integrating ecosystem and community adaptation brings many benefits and helps avoid maladaptation, especially in a country like Nepal where vulnerability is great and there is a high level of inter-connectedness between people and ecosystems. Working with community forest user groups enabled many interventions that built ecosystem resilience as well as community resilience. We had a special focus on empowering women and marginalized people, enabling them to participate effectively in the process and adapt to change.

Multi-disciplinary approach

It is important to take a flexible and multi-disciplinary approach, given how variable vulnerabilities are in a landscape. This often means working with partners from different sectors and disciplines. We are fortunate to have adaptation funding that can be used in a flexible way across different sectors (e.g. agriculture, water, forests, disasters), as long as it is reducing vulnerability of people and nature. Having the best available scientific and other information available from different sectors before doing vulnerability assessment and adaptation planning is very important.

Working at multiple levels

Site level adaptation alone is often not enough to address broader ecosystem processes; adaptation has to take place at multiple ecosystem scales. Water catchments are very useful natural units which are nested at different scales. This is particularly importance since, as climate change advances, conflict resolution and trade-offs will be increasingly necessary between upstream and downstream communities, and across sectors.

Working on different time frames

Since ecosystem changes seem to take longer than community changes to appear, we need to undertake interventions in the short term, but also plan for longer term change. We must be flexible and innovative, and continue to learn and adapt. Scenario planning has proved helpful to look at possible future trends and keep options open for the future.

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Disclaimer: This briefing sheet is made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of WWF Nepal and CARE Nepal and do not necessarily reflect the views of USAID or the United States Government.

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[1] Hariyo Ban Program is being implemented by a consortium of World Wildlife Fund (WWF), Cooperative for Assistance and Relief Everywhere (CARE), Federation of Community Forestry Users Nepal (FECOFUN) and the National Trust for Nature Conservation (NTNC)

Hariyo Ban's Approach to Climate Adaptation

Hariyo Ban's climate change adaptation (CCA) component works to reduce vulnerability and promote climate adaptation, taking an integrated approach that incorporates both ecosystems and rights based approaches[3]. On the ecosystem side this involves using ecosystem services as one way to build people's resilience to climate change (along the lines of ecosystem-based adaptation[4]), but goes an extra step is also working with local communities and others to understand ecosystem vulnerability and build the resilience of natural systems and species. This should enable ecosystems to continue providing services for human adaptation for longer, as well as helping biodiversity to adapt to climate change. The ecosystem work is integrated with the rights based approach of community based adaptation that focuses among other issues on building adaptation[5] capacity of the poorest, most marginalized and vulnerable people including women, who are often also the most dependent on forest products. Hariyo Ban works at multiple levels in its adaptation work, including community level, village development committee and district level, and at the level of protected areas, river basins and landscapes.

Interventions that Led to Learning

Activities that Hariyo Ban undertook in its adaptation work included:

- Hariyo Ban made an early start on adaptation at community level, modifying existing adaptation tools including CARE's Climate Vulnerability and Capacity Analysis methodology to integrate an ecosystem approach[6]. To prepare for the planning it first built the capacity of marginalized people and women to ensure that they could participate effectively in the community adaptation process. After four and a half years we have supported the preparation of over 400 community and local level vulnerability assessments and adaptation plans. Implementation of these plans was supported with seed funds, and in many cases local groups leveraged additional funding for them. Activities were extremely varied depending on locally identified needs, including forest conservation and restoration; agriculture; disaster risk reduction including use of bioengineering; health; water; and small-scale infrastructure.
- At larger scales, Hariyo Ban undertook vulnerability assessments for the two landscapes using Flowing Forward methodology developed by WWF and partners, that assesses the vulnerability of target species, ecosystem types (e.g. forests, freshwater, grassland) and human systems (e.g. agricultural systems and infrastructure). Existing results from community level adaptation planning were fed into the larger scale assessments. We did not produce stand-alone adaptation plans for the landscapes; instead we integrated the results when the Terai Arc Landscape Strategy was being revised and the new Chitwan-Annapurna Landscape Strategy prepared. Similarly, we also assessed the vulnerability of Manaslu Conservation Area (a protected area in the north of Nepal); and mainstreamed resilience building and climate adaptation measures into the conservation area's management plan as it was being revised.
- Recognizing that many species are likely to tend to move uphill to cooler, damper places as temperatures increase with climate change, we have worked to identify and restore forest corridors along altitudinal gradients. Many of these are along river valleys that cut through the extremely rugged terrain in CHAL, which ranges from a few hundred meters above sea level to over 8,000 m in the Annapurna range. If species can move, there is ample terrain for many lowland and mid-hill species at higher altitudes. However, in the high, rocky mountains there may be limitations such as lack of soil and water for plants.
- We have undertaken mapping based on topographical features to identify areas that are likely to be "micro-refugia" - areas that are less likely to be affected by climate change. These tend to be areas on north-facing slopes, and in steep river valleys. Species are likely to persist in these areas when they disappear from neighboring areas, and conservation of these areas is particularly important. Nepal's rugged and varied terrain means there are many opportunities for micro-refugia.
- We undertook a modeling exercise and worked with a grantee who did germination tests with seeds of different tree species at different temperatures; we will produce guidance on which popularly used and planted native tree species are more vulnerable to climate change, and which ones are more resilient in different ecological zones of the country. This will be used for future tree-planting programs, helping communities, government staff and private landholders to select tree species that are likely to persist in their areas for some time. This is important since trees live for many years, and a tree planted today is likely to experience significant climate change in its life time.

[3] Pascal Gerat, et al. (2010). Integrating community and ecosystem based approaches in climate change adaptation responses. Ecosystems and Livelihoods Adaptation Network. http://www.careclimatechange.org/files/adaptation/ELA_Integrated Approach_150412.pdf

[4] Ecosystem based adaptation is defined as: “the use of biodiversity and ecosystem services to help people adapt to the adverse effects of climate change as part of an overall adaptation strategy” (Convention on Biological Diversity (2009) Connecting Biodiversity and Climate Change Mitigation and Adaptation: Report of the Second Ad Hoc Technical Expert Group on Biodiversity and Climate Change. CBD Technical Series No. 41. Secretariat of the Convention on Biological Diversity, Montreal, Canada.

[5] Community-Based Adaptation a is defined as “a community-led process, based on communities' priorities, needs, knowledge and capacities, which should empower people to plan for and cope with the impacts of climate change.” Reid, H., M. Alam, R. Berger, T. Cannon, S.Huq, and A. Milligan. 2009. Community-based adaptation to climate change: an overview. In Participatory Learning and Action, issue 60, pg. 13.

[6] Regmi, S.K. and Rijal, D. Nepal. 2014. Vulnerability assessment and adaptation planning: Training of trainers manual. CARE Nepal, Lalitpur, Nepal.

Successes and Challenges

After the first three and half years of project implementation, some major achievements as well as challenges were identified:

Successes

- All community adaptation plans incorporated ecosystem activities, with some early successes. For example, bioengineering has in some cases reduced flooding and soil erosion. Faced with dwindling water supplies, several communities have protected their water sources by prohibiting grazing and restoring forest in the recharge area, with good results. By identifying those who are most vulnerable in the community (often they are also the most dependent on forest resources), we have been able to empower them to gain a more equitable share of forest resources and take part in decision making on management of their forests. In some cases they have developed alternative livelihoods, which help to relieve unsustainable pressure on forests and build ecosystem resilience. Many communities are protecting their forests from uncontrolled fire, which can be exacerbated by climate change.
- Our adaptation work required support for a wide range of adaptation activities based on identified needs to reduce climate vulnerability. They ranged from agriculture and forest management to disaster risk reduction, health and family planning, village access improvement, strengthening of community institutions, and empowerment of women and marginalized people. This was important since vulnerability often varies greatly from one community to another.
- Since the community level adaptation planning got off to an early start, we were able to bring community level inputs to broader level vulnerability assessment and planning (e.g. at landscape and protected area level). This helped ensure that vulnerability issues important to local people were taken into account at higher levels.
- Integrating climate adaptation into landscape planning enabled us to take a longer term view than at community level, since landscape plans are for ten years. We included results from top-down long-term climate modeling as well as the bottom-up results from local level.

Challenges

- We aimed to provide ecosystem information for the community level vulnerability assessment and planning through the broader ecosystem analyses. However, in practice the information was often too broad to be useful at local level, or it was not ready in time. In hindsight, we should have had more capacity to work on ecosystem assessments in time for the community level work. There should also have been better access to existing ecological and climate data, with downscaling to sub-national level wherever feasible. We are now producing guidance on vulnerability of popular native tree species to climate change, but we should have had this information earlier, so that it could be used in species selection for planting programs that we supported.
- While impacts of shorter term climate variability are already being experienced by many of the local communities we work with, it is more difficult to identify species and ecosystem impacts. This is partly because they are often not well studied and are likely to be complex (for example, if the flowering dates of an important plant species change because it is warmer, it may miss the emergence of an insect pollinator). In addition, ecosystem impacts appear to be taking longer to show up than human impacts. There could be future "tipping points" where they undergo rapid change – for example, a rapid succession of hot forest fires due to hotter, drier conditions, from which the forest cannot recover.
- We realized early on that often it was not possible for communities to build their resilience solely by taking action within their own areas (e.g. a community forest or farmland). Many ecosystem processes cover larger areas. For example, some communities faced flooding and sediment deposition from more extreme rainfall, and were unable to control overgrazing and deforestation higher up in the catchment, where these non-climate stresses were exacerbating the problem. We adapted our approach and started promoting collaboration between upstream and downstream communities in small water catchments to resolve this type of problem, through joint observation of the catchments, identification of relevant issues, and joint implementation of adaptation activities designed to ensure critical ecosystem services.
- Water catchments make excellent ecological units for climate adaptation, but they often do not correspond with political boundaries or institutions (e.g. VDCs, districts), making it difficult to collaborate with local authorities on water catchment-based adaptation approaches.