

Community Forestry: Well Placed to Address Climate Change Challenges in the Terai, Nepal

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Key Lessons

Community forestry institutions in Nepal provide a potential basis for resilience to climate change impacts. This case study demonstrates that one of the significant contributions made by community forestry is its potential to provide equitable structures for local-level decision-making and benefit sharing, in ways that are innovative and may be applicable to contexts of climatic and ecological change. While State-led responses to disaster management and climate change adaptation are often lacking, community forestry institutions have already begun to play a valuable role in providing practical responses to adaptation needs.

However, community forestry is far from being a silver bullet. To support effective and sustainable climate change adaptation a number of barriers must be addressed such as punitive regulations, exclusion, non-representative decision-making and benefit sharing, and insecure access rights. Further, owing to prevalence of high-value hardwood timber in the Terai, sustainable forest management continues to be challenged by illegal logging, corruption, and continuing deforestation.

In this context, for community forestry to meet climate adaptation and mitigation goals some key messages have emerged:

- A sustainable livelihoods approach that supports climate change adaptation must be mainstreamed within development initiatives, including community forestry institutions. User group committees are among the few decentralized local institutions well placed to respond to urgent development needs.
- Forest ecosystems are changing as ecological and climatic conditions change. This requires adapting to changing forest species composition. Forest management must increasingly consider species and management approaches that are appropriate under new conditions; communities should play an important role in their development.
- Mitigation initiatives, such as REDD+, must be part of a bundled approach to conservation and securing livelihoods. The objectives of carbon sequestration must be balanced against needs to ensure subsistence activities and forest-based income; these objectives must not threaten local livelihoods.



Timeline

- 1957** The Nepal Government nationalizes forest areas. The Government gains control of the communal forests in Sarlahi District, rendering traditional uses of forestland and products for subsistence purposes illegal.
- 1960s** In response to food insecurity and general hardship in the mid-hills, waves of high-caste uplanders begin to migrate to the areas surrounding Sarlahi District and to the rest of the Terai, increasing deforestation and displacing indigenous peoples.
- 1973** A settlement commission recognizes the rights of the migrants and provides them with land titles, while the Terai's indigenous peoples continue to lack recognition.
- 1990s** Forests in the Churia, the hilly areas of the Terai, are largely barren and the lowland Terai forests are seriously degraded.
- 1993** A large flood damages livelihood assets and results in loss of life in Sarlahi District. The Sibeswor community responds by forming a Community Forest User Group (CFUG) to improve their natural ecosystem defenses.
- 2000s** The community begins to perceive changes in weather patterns and climate such as prolonged droughts and seasonal variability.
- 2007** Community Forestry Guidelines are developed to designate roles, responsibilities, and processes for community forestry stakeholders in Nepal, including provision of inclusive committee structures.
- 2008** 2008-2011: the CARE-initiated Churia Livelihood Improvement Program (CHULI), in Sarlahi District, focuses on poor and excluded CFUG members

1. Background

The forestry context in the Terai, the southern region of Nepal that borders India, differs greatly from the rest of the country. Though recent regional studies indicate decreasing rates of deforestation in the Terai, during Nepal's last forest inventory in 1994, the Terai was experiencing the country's highest rates of deforestation at 1.65% (Kanel, K. *et al.*, 2009). Several explanations have been given for this: the Terai contains significant amounts of high-value timber, in particular Sal (*Shorea robusta*) and road construction has increased accessibility for migrants and to nearby Indian markets. Given the high value of forest products in the Terai, there are powerful incentives for elite capture and corruption. The complex social dynamics in the Terai further challenge efforts for equitable and transparent governance. As a result, the Government has prioritized the more centralized Collaborative Forest Management (CFM) model for the Terai rather than community forestry approaches; this means villagers have less direct involvement in forest management than their counterparts elsewhere in the country. However the three villages targeted in this study - Sibeswor, Bishnupur, and Balganga - employ the community forestry model and have established CFUGs.

In the past, Sarlahi District was known for the collective forest management practiced by its many indigenous communities. However, following the 1957 nationalization of Nepal's forests, all communal forests came under Government control. Overnight, traditional subsistence uses of forestland and products were prohibited.

The lowland forests of the Terai and the Churia first came under threat during multiple waves of migration and, by the 1990s, were highly degraded. This contributed to the area's vulnerability, for example, to flooding and soil erosion. In 1993, a large flood in the district resulted in significant damage and loss of human life. This led to a range of local-level responses, most notably reforestation near rivers and, ultimately, the formation of several community forests including the Sibeswor example.

Community forestry approaches in the area have leaned towards stricter conservation measures than other parts of the country. These include operational management plans that limit collection of forest products, free grazing of livestock, and other subsistence activities. In an effort to support local-level resilience, a number of development service providers, including the District Livestock Support Office, CARE International, and the Federation of Community Forest User Groups, Nepal (FECOFUN), have been working intensively with several CFUGs in the area, including the Bishnupur and Sibeswor groups.

2. Climate Change Impacts in Nepal and in Sarlahi District

Increased Temperature

Since the mid-1970s average air temperature in Nepal has risen by 1° Celsius (Shrestha *et al.*, 1999). At the local level in Sarlahi, communities are acutely aware of this change. Local communities have reported atypical heat stresses during summer and severe cold during winter over the past decade. Days and nights are becoming warmer, while cool days and nights are becoming less frequent. Increasing temperatures have reduced the productive capacity of agricultural workers. People used to farm throughout the day, but are now often unable to work between 10.00 and 14.00 hours, which has an impact on income and food security.

Changing Seasonality and Rainfall Patterns

The most severe impacts are drought and water scarcity. Communities have noted shifts in wet season patterns in the least ten years, with erratic rainfall of shorter duration but greater intensity. This is supported by national trends of irregular monsoon patterns resulting in droughts and floods (Bajracharya *et al.*, 2007). The eastern parts of the Terai in particular experienced reduction in rainfall during 2005 and 2006, leading to a 12.5% decline in national crop production (Regmi, 2007). This has induced farmers in Sarlahi to petition for the district to be listed as drought-prone (CARE project staff, personal communication). Over the same period, however, the western Terai experienced heavy rains, flooding, and cloud bursts, reducing annual production by 30% (*ibid*). These changes in weather patterns are affecting the growth, ripening, and storage of rice, as well as the cultivation of other traditional crops.

Changes in Local Biota

Erratic rainfall has also coincided with changes in soil composition, with apparent declines in soil moisture content. The villagers associate this with the diminishing presence of frogs, earthworms, insects, and other biota needed to create humus and control pests. They note that infestations of pests, such as white grubs and locusts, pose increasing hazards for crops; insect-borne diseases, like malaria, dengue fever, and ringworm, which had previously been eradicated in the area, have re-emerged. The villagers link shifts in seasons and temperature variability to changes in fruit and seed production, as well as the shrinking availability of important medicinal plants. The ranges of a number of endemic tree species, particularly those with high water demands, have retreated to high altitude, hilly areas, or appear to have disappeared from the area altogether.

3. Assessing Adaptive Capacity and Resilience

Adaptive Capacity

The capacity to adapt to climate change is rarely determined by physical impacts alone, but rather by a combination of factors, including socio-economic dynamics. In this context access to and control over livelihood assets are key determinants of adaptive capacity (CARE, 2010). Access to education, financial strength, and social capital are fundamental to long-term adaptive success. This study has analyzed different social groups to assess adaptive capacity and resilience (Table 1).

Table 1: Assets in Curahnongko

Type	Mid-hill migrant groups (high caste)	Indigenous ethnic groups	'Madhesh' (Indian-origin) groups	'Low caste' groups (Dalits, etc.)
Natural	<ul style="list-style-type: none"> ▪ Land ▪ Private forest ▪ Tube wells ▪ Improved variety of cattle 	<ul style="list-style-type: none"> ▪ Community forest ▪ Public tube wells ▪ Unregistered land 	<ul style="list-style-type: none"> ▪ Registered land ▪ Public tube wells 	<ul style="list-style-type: none"> ▪ Some members have access to community forest ▪ Degraded land access

Type	Mid-hill migrant groups (high caste)	Indigenous ethnic groups	'Madhesh' (Indian-origin) groups	'Low caste' groups (Dalits, etc.)
Physical	<ul style="list-style-type: none"> ▪ Cement accommodation ▪ Good road access ▪ Temple 	<ul style="list-style-type: none"> ▪ Thatched housing ▪ Partial road access ▪ Community meeting structure 	<ul style="list-style-type: none"> ▪ Thatched housing ▪ Community meeting structure 	<ul style="list-style-type: none"> ▪ Thatched housing ▪ Poor road access ▪ Community meeting structure
Financial	<ul style="list-style-type: none"> ▪ Government employment ▪ Cooperatives ▪ Trade/market ▪ Savings 	<ul style="list-style-type: none"> ▪ Alcohol production ▪ Seasonal migration to Kathmandu and to Gulf countries as unskilled laborers 	<ul style="list-style-type: none"> ▪ Seasonal migration to India as wage laborers ▪ Availability of credit 	<ul style="list-style-type: none"> ▪ Wage labor ▪ Traditional caste-based occupations ▪ Seasonal labor-based migration ▪ Availability of credit
Human	<ul style="list-style-type: none"> ▪ Relatively high education ▪ Entrepreneurial and able to exploit market opportunities 	<ul style="list-style-type: none"> ▪ Agricultural labor ▪ Fuelwood collection and marketing 	<ul style="list-style-type: none"> ▪ Fuelwood collection and marketing ▪ Labor for local enterprises 	<ul style="list-style-type: none"> ▪ Agricultural labor ▪ Fuelwood collection and marketing ▪ Labor for local enterprises
Social	<ul style="list-style-type: none"> ▪ Broad kinship groups ▪ Membership in CFUGs and almost all community organizations 	<ul style="list-style-type: none"> ▪ Ethnic- and cultural-based networks ▪ Membership in CFUGs 	<ul style="list-style-type: none"> ▪ Membership in CFUGs 	<ul style="list-style-type: none"> ▪ Membership in CFUGs
Overall Adaptive Capacity	High	Relatively low	Moderate	Low

Note: These assessments were based on a qualitative review of the range and extent of various livelihood assets available to different community groups.

In addition to natural resource management and livelihood support, the two CARE projects operating in Sarlahi have assisted Bishnupur and Sibeswor CFUGs in developing community adaptation plans of action (CAPAs). These involve the mapping of climate change hazards and hotspots as well as capacity building to facilitate processes for community-based adaptation.

As a result, awareness about climate change and its impacts has grown within these CFUGs, unlike Balganga CFUG which has not received this intervention. However, there is still considerable work to be done in Bishnupur and Sibeswor, particularly with regard to ensuring equity and inclusion. Current adaptation plans do not explicitly consider the most vulnerable groups and their participation in capacity development efforts remains nominal.

The community forests are perceived to be an important buffer to changes observed in the surrounding environment. Productive land closer to forests has greater soil moisture content and water retention capacity, enabling it to better withstand the effects of low rainfall.

Recognizing its value, the three communities have focused forest management efforts on enhancing biodiversity by planting a range of native species.

CFUGs are uniquely positioned within Nepal to manage and respond to the impacts of various ecological changes on different segments of society. Because the committees are mandated to include members from all social groups, they are often able to disseminate information more broadly than other institutions. In addition, CFUGs provide entry points for development service providers and are also important providers of low-interest credit.

Traditional caste- and gender-based dynamics are changing due to the influences of globalization and domestic political trends, with the 'untouchability' of certain castes diminishing in recent years. FECOFUN has successfully instituted groundbreaking gender representation requirements, mandating 50% of key CFUG committee positions to be held by women. While not always perfect in application, this has contributed to the establishment of norms in the context of community forestry and beyond. Among the three CFUGs involved in this study, women chaired two of the three executive committees. However, the degree to which this demonstrates genuine gender representation is unclear. The Terai remains generally quite conservative on issues of gender relations (as well as caste) and, in at least one of the CFUGs studied, the chairperson was the only woman in attendance and the committee had established a special all-male advisory sub-committee to 'advise' her on decisions.

4. Vulnerabilities

Poor and socially marginalized groups in Nepal are more vulnerable to climate change impacts (NCVST, 2009). For most forest-based communities in the Terai, the biggest barrier to adaptation is access to and control over livelihood assets. People who have tenure security over land and forests tend to have more adaptive capacity than those who do not (IPCC, 2007). Landholders have the capacity to absorb risks associated with experimental agricultural practices and crops. They tend to be wealthier individuals whose diverse assets and greater range of options put them in a better position to respond to climate change impacts.

Historically, low-caste or 'untouchable' groups were prevented from living in more populated areas, so they were forced to settle in marginal and hazard-prone locations. Bishnupur and Sibeswor villagers generally comprise lower-caste and indigenous groups who live near rivers, making them more vulnerable to flooding. A similar trend is seen with respect to employment and livelihoods. Poor agricultural laborers and women are particularly vulnerable to drought, floods, and extremes of heat and cold.

Typical to CFUGs in the Terai, the three villages have restrictions on free grazing in forest areas, green timber extraction as well as collection of fuelwood and non-timber forest products (NTFPs), including traditional medicinal plants. The restricted access makes it difficult for poorer households to meet subsistence needs or generate income from sale of fuelwood, production of furniture, and other traditional industries.

The forest-use restrictions place a disproportionate burden on the most vulnerable members of society. For example, restrictions on the harvest of medicinal NTFPs have forced community members to seek conventional medical attention from hospitals with associated high costs. Women bear a particularly onerous burden. As both household energy needs as well as livestock feeding are their responsibility, they have suffered from the restrictions on fuelwood and fodder collection. Stall-rearing of cattle has led to an approximate decline of 50% in livestock numbers. The corresponding decline in dairy products is believed to have contributed to a rise in osteoporosis and other bone complaints among women. Dairying is also one of the

few sources of revenue controlled directly by women and the decline in livestock has led to diminished earning potential and status for women in the community.

Decision-making is not always equitable in the CFUGs. Officially, it is participatory and consensus-based but, in practice, it is dominated by community elite, generally men from higher castes. There are also complaints of incorrect electoral lists at the district level, which determine residency and voting rights. There are claims that certain groups, such as landless individuals, religious minorities, and indigenous peoples, are sometimes excluded.

The presence of valuable timber species in the Terai such as Sal (*Shorea robusta*), Karma (*Adina cardifolia*), and Khayar (*Acacia catchu*) make illegal harvesting, as well as corruption, tempting and pervasive.

5. Responses to Environmental Changes and Development Needs

Despite the range of livelihood assets in Sarlahi communities, in particular the role of CFUGs in responding to local-level needs, they still have serious challenges to address and are endeavoring to respond to.

Only 25% of water needs in the Sibeswor area are met during extended dry periods. During summer, water sources tend to be located close to more affluent and higher-caste groups, while lower-caste and indigenous groups often live in uphill areas with less direct water source access. Some responses have involved covert night-time water 'borrowing' by the uphill villages from the wells and streams of downhill neighbors. This has led to strained relations and, at times, conflicts. Other strategies have involved experimenting with rainwater harvesting and re-locating remaining crops closer to dependable water sources, none of which are providing successful.

Diminishing agricultural productivity due to chronic water shortages has resulted in attempts to cultivate more drought-resistant cash crops, such as sugarcane. While this provides cash income, it creates dependence on market prices and reduces both food security and diversity. The option also seems to benefit wealthier landowners who can afford the investments and benefit from economies of scale.

As livestock numbers have dwindled, district agricultural extension officers and veterinary professionals are promoting the adoption of improved livestock varieties (*Jarsi* cows and *Murra* buffalos) that produce up to five times more milk than the indigenous stock. However, these varieties are much more demanding in dietary requirements, needing greater amounts of water and high-quality fodder; they are consequently increasing community workloads, especially for women.

6. Climate Change Adaptation, Mitigation, and Community Forestry Linkages

Arguments are growing for climate change adaptation and mitigation efforts to be combined for greater overall benefit (Bernier and Schoene, 2009); community forestry, especially in countries such as Nepal, may provide a valuable modality for such an integrated approach. Despite Sarlahi being notorious as a district where illegal logging has continued despite community forestry (Nepal Times, 2011), local residents of the two CARE-supported CFUGs vouch that

forest cover and carbon stocks have increased since the establishment of community forests. This is corroborated by local forestry officials.

Nepal serves as a model for how community forestry could provide the foundation for linking mitigation and adaptation efforts. Where community forestry institutions are strong there is the potential to maintain and perhaps even enhance forest cover. The CFUGs studied also provide insights into how adaptation needs can be incorporated, with development service provider support, though how to do so without compromising livelihoods needs further consideration.

Community forestry in Nepal provides important structure that can be built upon in the context of REDD+. In the CFUG structure, local resource persons facilitate forestry activities and relevant training. These same individuals could be engaged in providing community-level support on REDD+ readiness and implementation. CFUGs all have the advantage of established forestry monitoring sub-committees that oversee auditing and are responsible for ensuring transparency.

Community Forestry - Supporting Adaptation

Community forestry has long provided a buffer against environmental and climate change impacts in Nepal. Reforestation is a strategy for rehabilitating watersheds and ensuring water supply. While community forestry regulations are intended to be pro-poor and contribute to improve livelihoods through sustainable resource management, in practice they are often employed to the benefit of community elite. Despite these challenges, the pro-poor approach embraced by community forestry has nonetheless led to the improved status of marginalized groups by mandating gender, caste, and poverty-based quotas and normalizing the participation of these groups in decision-making.

Bishnupur and Sibeswor CFUGs, with support from CARE, have demonstrated the potential role of community forestry in climate change adaptation. Over the past ten years, the two CFUGs have sought to develop resilience to natural disasters and changing environmental patterns through reforestation, river bank management, and strategic land-use management strategies. They have operated with a much broader mandate than strictly focusing on forest management - sharing information to support agricultural productivity, supporting alternative livelihood development, providing credit, and taking the lead in disaster risk mitigation.

In addition to serving as the strongest entry point for development service providers in a range of sectors, CFUGs represent one of the most stable institutions in rural areas. During times of political instability, they have often offered the only local form of democratic governance. In rural Nepal, they appear to be the institutions most capable of facilitating climate change adaptation at local levels.

Trade-offs

At times, however, there are trade-offs between forest conservation and the package of livelihood assets that the community needs for its well-being and resilience. The strict regulations imposed by community forestry management plans, particularly in the Terai, impinge on livelihoods and may disproportionately affect vulnerable groups.

These tensions include:

Politicization: The forestry sector in Nepal is highly politicized and political pressures affect CFUGs. Partisanship influences both community-level decision-making and the distribution of benefits. This may be a factor should REDD+ related processes become associated with the interests of local elite.

High-value timber forests: The high value of some timber species in the area means that the opportunity costs associated with maintaining forests in the Terai are higher than those in other parts of the country. The high values encourage external interests as well as those of community elite. Thus, while opportunity costs for engaging in REDD+ might appear to be low where timber harvesting is already prohibited, the reality is that REDD+ will need to compete with 'unofficial' profits being generated by the timber.

Landlessness: Landlessness is a major threat to Nepal's forests and will be exacerbated by climate change impacts as increasing amounts of land become non-farmable. Forests are seen by landless groups to stand in the way of livelihoods and food security. These groups have been mobilized into networks throughout much of Nepal, with the primary objective of converting forest to productive agricultural land. The viability of REDD+ will be compromised until food security and landless issues are addressed for the communities concerned.

Problems of land tenure: Tenure and carbon rights are problematic in the context of community forestry in Nepal. While community forestry allows access to and use of forest products under controlled arrangements for a period of five years, the actual land and associated carbon rights are owned by the Government. Communities may be reluctant to make investments and concessions related to REDD+ projects if their rights to benefits are not assured.