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The Kangchenjunga landscape in the transboundary region of Nepal, Bhutan, and India has rich forest resources offering a wide range of ecosystem services to local people and habitats for many rare plant and animal species. Despite conservation efforts in several fragmented protected areas in the past, forest ecosystems and their multiple functions have been affected by over-extraction of resources, haphazard land use practices, intensive agriculture, overgrazing, unmanaged tourism, and unplanned infrastructure development. We describe a multi-level and multi-stakeholder transboundary process initiated in 2002

with the overall objective of restoring fragmented and deteriorating forest resources through development of conservation corridors and adaptation of conservation measures, moving from a species approach to a landscape approach. In collaboration with governmental and non-governmental organizations, academics, and communities, the International Centre for Integrated Mountain Development (ICIMOD) has been addressing the conservation issue by promoting participatory reforestation and transboundary collaboration, and linking conservation with sustainable use of resources by local communities.



Searching for alternative conservation approaches

The Kangchenjunga landscape (KL) extends from eastern Nepal to western Bhutan, passing through Sikkim and Darjeeling in India. It is an important repository of diverse forest resources, a habitat for many globally significant animal species, and the home of long-established populations (Figure 1). According to 13 baseline studies on ecological functions conducted by experts (feasibility assessments) and numerous consultations and participatory planning processes at local (community/village), national (corridors) and regional (landscape) levels organized by ICIMOD, many of the 14 protected areas already established are contiguous beyond the political boundaries of single nations. Validation of land use patterns along the corridors using remote sensing and global information system tools revealed that the forested corridors naturally connected most of the protected areas in the past. Increasing, unplanned, and uncontrolled human activities have disrupted these connections, intact 50 years ago: by 2005, 24% of the corridor areas were cultivated lands, 7% were barren, and 2% had become settlements.

The protected areas in the KL are neither large, numerous, nor connected enough to maintain ecological integrity on their own, nor adequate enough to continue providing ecological services for human well-being. They are often estab-

lished as ‘conservation islands’ focusing primarily on genetic, species, and ecosystem conservation, without taking account of the sociopolitical and economic complexities involved.

The major challenge to the people living in the region is to use these ever-dwindling resources in a sustainable manner. People are an integral part of the landscape, as they derive various ecosystem services such as *provisioning* (eg food, fodder); *cultural* (aesthetic, religious); *supporting* (soil formation and water cycle); and *regulatory* (erosion, climate) services. Recent transboundary research

FIGURE 1 Kangchenjunga mountain range and settlements in the forested landscape, as viewed from Darjeeling, India. (Photo by Nakul Chettri)

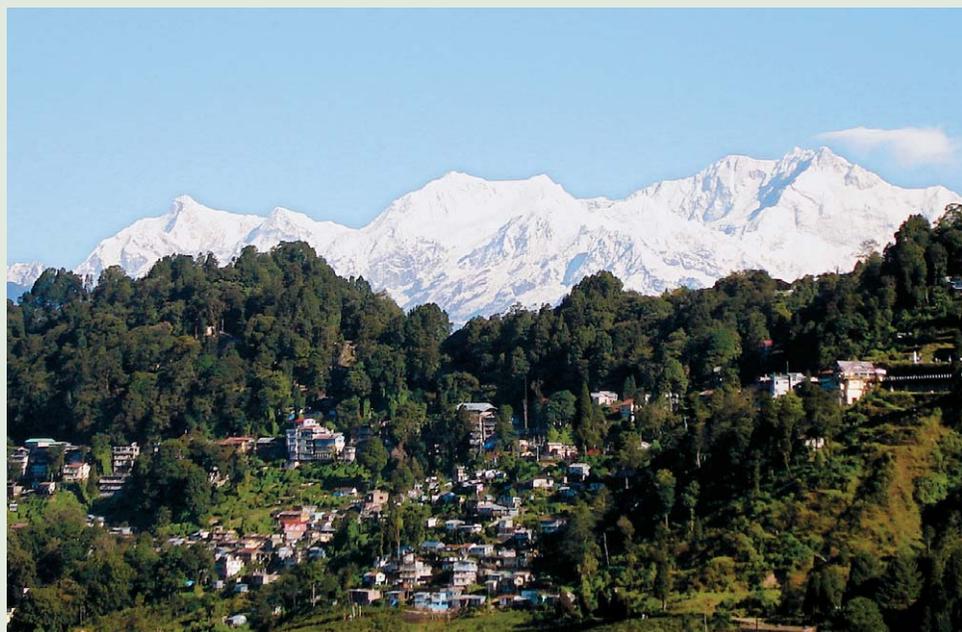
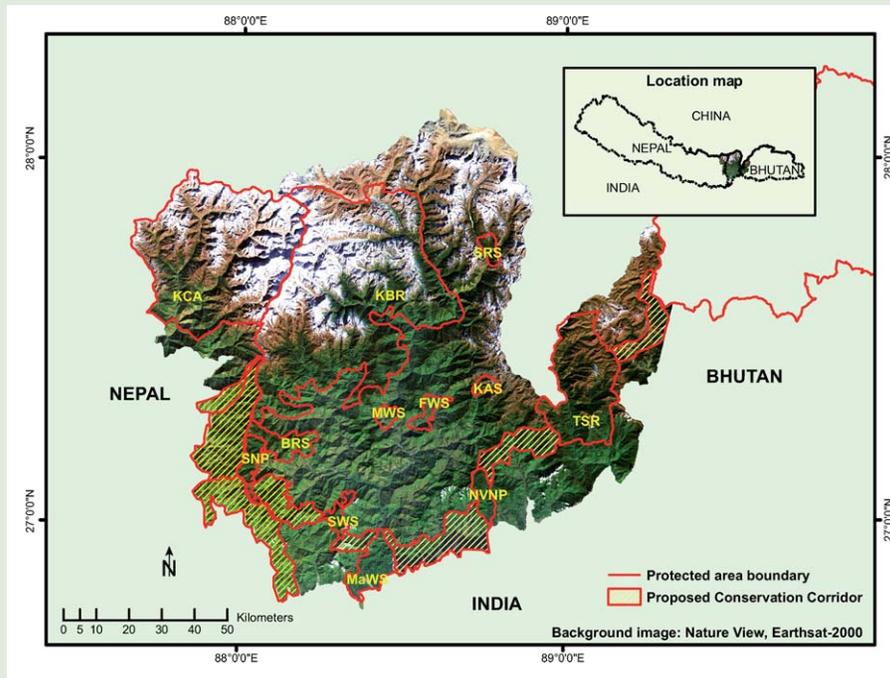


FIGURE 2 Protected areas and proposed corridors in the Kangchenjunga landscape: KCA: Kangchenjunga Conservation Area, Nepal; KBR: Kangchenjunga Biosphere Reserve; BRS: Barsey Rhododendron Sanctuary; FWS: Fambong Lho Wildlife Sanctuary; SRS: Singba Rhododendron Sanctuary; MWS: Mainam Wildlife Sanctuary; KAS: Kyongnosla Alpine Sanctuary, Sikkim, India; SNP: Singhalila National Park; SWS: Senchel Wildlife Sanctuary; MaWS: Mahananda Wildlife Sanctuary; NVNP: Neora Valley National Park, Darjeeling, India; and TSR: Toorsa Strict Nature Reserve, Jigme Dorzi National Park, Bhutan. (Map by Birendra Bajracharya)



“Local people are integral to the landscape concept, and integrating economic opportunities with conservation will help meet conservation objectives as well as ensure the maintenance of the developed landscape.” (Dr Gabriel Campbell, former Director General, ICIMOD)

supported by ICIMOD has revealed that there is persistent poverty, with about 70% of the people in and around protected areas and inside proposed corridors living on less than US\$ 2 per day, owing to limited developmental activities in the area. Moreover, people’s livelihoods depend nearly entirely on natural resources in the area; this is all the more reason for maintaining the functionality of the complex (forest) ecosystems on which they depend—a functionality that itself depends on corridors of ecological integrity which cross international borders. Thus these borders have a potential to play many vital roles, not just as gateways for people and goods or zones of socioeconomic, cultural, and environmental integration, but also as filtering zones for illicit activities.

This situation offers opportunities for cooperation at several levels, particularly in relation to wise management and use of forest resources that preserve ecosystem goods and services across the landscape. ICIMOD advocates this new approach to conservation; for the last decade, the region has witnessed a changing paradigm in forest management, though initiatives are still limited to small pockets of the landscape.

Strategic partnerships and planning process

Realizing the importance of the KL, in 2002 ICIMOD joined with the governments of its 3 Hindu Kush–Himalayan member countries—Nepal, Bhutan, and India—and with other partners to initiate this project. The project tried to advocate a) ecosystem management linking countries across borders and protected areas by developing conservation corridors; and b) addressing transboundary issues through cooperation and coordination of policies and institutions to mutually harness the environmental services defined in the Millennium Ecosystem Assessment, and their trade-off values. The primary focus was given to re-establishment of natural conservation corridors through participatory forest management and enhancing the livelihoods of the people inhabiting the corridors.

The project involved the following steps:

- 1997–1998: ICIMOD, along with experts, governments, non-governmental institutions, and global conservation organizations (WWF, The Mountain Institute, UNDP) identified the KL as a critical transboundary area for biodiversity conservation.
- 1998: WWF made a preliminary biodiversity assessment and tried to identify gaps; it recommended regional cooperation and extension of conservation areas across the KL.
- 2002: as an intergovernmental, international institute in the region, ICIMOD further developed the idea of landscape conservation and identified 6 potential corridors based on contiguity of forests, past natural history, and community knowledge about use of these corridors by wildlife.
- 2003–2004: feasibility assessments for developing corridors through consultations (local and national levels) were conducted with diverse stakeholders (policy-makers, conservation authorities, academicians, conservation and development organizations, and local communities).
- GIS and Remote Sensing tools were used to supplement and delineate cor-

ridors and cross-check the potential forested areas for connectivity. Micro-watersheds, forest cover, agroforestry patches, and animal migration areas were considered as key criteria.

- 2005: the concept was shared and a consensus developed with all partners during a regional consultation, in which ICIMOD consolidated the outcomes of feasibility assessments with agreed plans of action.
- ICIMOD took the lead role in following the recommended actions of regional consultation with the help of partners.
- 2005–2006: comprehensive baseline information on biodiversity and corridor development and management plans for each of the identified corridors was collected, using participatory tools involving local communities and conservation practitioners working in the area.
- 2007: based on the outputs from consultations, baseline information, and management documents, ICIMOD developed a regional strategic document on management of corridors and the landscape, and a regional cooperation framework.

Results of the process

During the feasibility assessment 6 potential conservation corridors linking 9 protected areas were identified (Figure 2). The corridor development plans—resulting from a village-level participatory process—were consolidated into comprehensive national corridor development plans for each of the participating countries. The Nepal corridor plan has already been incorporated into the strategic planning document for Sacred Himalayan Landscape developed by the Government of Nepal in 2006. Considering the regional perspective of the project, a regional cooperation framework for implementation of the Convention on Biological Diversity (CBD) was developed to meet regional requirements, as per the decision of the conventions (VII 11 and 23) that advocate an ‘ecosystem approach’ and ‘regional cooperation’ in transboundary landscapes. This opened an avenue for experts and government representatives

from 3 member countries to visualize and discuss conservation and development concerns in the context of common regional strategic directions.

In the planning process and the management documents, restoration of forested corridors was prioritized as a local mechanism to integrate conservation with community needs in order to maintain ecosystem resilience. Emphasis was given to restoring ecological integrity and improving the productivity and economic value of degraded lands so that the multifunctionality of ecosystems can be maintained by these corridors and the landscape (Figure 3). In the corridor management plans, communities living in or adjacent to corridors were provisioned to capitalize on agroforestry and organic farming-based livelihoods instead of intensive agriculture, which has degraded the forested areas in the corridors in recent years. Forest-based enterprises such as medicinal plant cultivation, agroforestry, and ecotourism were emphasized for local economic development and poverty alleviation, mainly to restore and maintain multifunctionality and minimize further impacts (Figure 4).

ICIMOD envisaged facilitating implementation of the regional strategies by supporting each of the governments in

“It is imperative that the conservation and development strategy that you are going to address has a strong bearing on transboundary cooperation, which will be a reality in the near future.” (Mr Chandi Prasad Shrestha, Former Secretary, Ministry of Forests and Soil Conservation, Government of Nepal)

FIGURE 3 Kangchenjunga forested landscape in the Sanchel–Mahananda corridor in India. (Photo by Nakul Chettri)



214 **FIGURE 4** Most people living in the corridors of the Kangchenjunga landscape are subsistence farmers. Diversifying to conservation-linked farming and marketing are expected to enhance conservation and sustainability. (Photo by Nakul Chettri)



“Medicinal plant cultivation has many more advantages, as this practice brings economic benefit to the community while also addressing conservation concerns.” (Mr Netra Prasad Burja, Farmer, Maipokhari, Nepal)

developing implementation and business plans, and enhancing the capacity of strategic partners working for conservation in these countries in order to access and develop funds for implementation of the strategies in the KL.

Key lessons learned

In such a complex setting as the KL, bringing all the stakeholders into one

platform to discuss a common conservation goal and mutual benefits was a great challenge and a time-consuming process. Participatory and consultative processes from the inception phase were found to be very critical and an important strategy for addressing need-based development and multi-stakeholder partnership. Support from government agencies was the key pillar in this process.

Human dependency on the forested landscape is one of the most important drivers of habitat degradation; but obviously, the solution cannot be to further deprive the population of access to the resources they rely on. All 3 governments, including conservation practitioners, realized that conservation of protected areas would be more effective if a people-inclusive landscape approach was practiced. Participation of local communities was overwhelming as they envisaged alternative economic options.

The efforts of ICIMOD and its partners are gradually effecting a paradigm shift from a conventional ‘people-exclusionary’ approach towards integrative conservation of a transboundary landscape. Restoring forested connectivity to create a wider conservation landscape is becoming acceptable to all 3 participating countries in the KL. This initiative is gradually increasing the supply of ecosystem services.

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