

Policy Issues of Land-Use and Land-Tenure Systems and Natural Resource Management in the Proposed Conservation Corridors in Darjeeling

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The effort of conserving biodiversity by establishing conservation corridors should be in consonance with the policies pursued at various levels.



Introduction

Darjeeling is an important district in the state of West Bengal, India. It has a rich biodiversity blended with a diverse culture. Covering an area of 3,255 sq.km, the district is located between 26°31' and 27°13' N and 87°59' 30" and 88°53' E. It is divided into three subdivisions; Kalimpong being the largest (1,057 sq.km), followed by Darjeeling (936 sq.km) and Kurseong (425 sq.km). It shares boundaries with Nepal to the west, Sikkim to the north, and Bhutan to the east. There are five important conservation areas in the form of wildlife sanctuaries and national parks covering above 10% of the total land area (CEPF 2005). These protected areas are scattered as 'islands' of conservation without the connectivity needed to ensure the long-term survival of species. In 2003, the International Centre for Integrated Mountain Development

(ICIMOD) introduced a landscape approach to conservation focusing on developing connectivity and transboundary cooperation (Sharma and Chettri 2005). Through consultations with experts, conservation authorities, and civil society and through research, it was found that there is an urgent need to establish forested paths or conservation corridors between different protected areas in this biodiversity-rich pocket of the eastern Himalayas (Pradhan and Bhujel 2000). Following a consultation held in Darjeeling in 2003, research on different aspects of biodiversity conservation measures was commissioned from different experts and institutions. This paper is part of this research endeavour.

The report is generated from a comprehensive study carried out on policy and land-tenure aspects in three of the potential corridors: Singhalila National Park (SNP) with Senchel Wildlife Sanctuary (SWS); Senchel Wildlife Sanctuary with Mahananda Wildlife Sanctuary (MWS), and Mahananda Wildlife Sanctuary with Neora Valley National Park (NVNP).

The major objectives of the study were to

- Review policies on natural resource management and land-use and tenure systems for each of the identified corridors emphasising the gaps;
- Analyse social, economic, and environmental issues for each corridor; and
- Develop a framework of joint action between institutions in order to develop conservation corridors, taking community participation as the key element.

The basic criteria for selection of corridors were based on consultations, assessment of natural migration routes of wildlife, the existing forest cover, the number and width of the gaps, and the presence of large settlements. Since major sections of the corridors pass through government reserve forests, a detailed study was carried out to examine gaps or bottleneck areas.

Results

The research revealed that there are three potential corridors in Darjeeling that were once naturally connected to the three key protected areas. The detailed findings from the corridors in terms of land-use pattern and land-tenure systems, and their relationships to national and regional policies, are given below.

Land-use patterns and gaps

Corridor I: Singhalila National Park- Senchel Wildlife Sanctuary

This corridor passes through a continuous belt of montane, wet temperate broad-leaved forest with occasional patches of *Cryptomeria japonica* and *Alnus nepalensis* plantations mixed with other broad-leaved forests containing species such as *Symingtonia*, *Machilus*, *Castanopsis*, and *Magnolia*. The altitude varies from about 2,000 to 2,500m. The forests are mostly reserve forests except in the gaps identified below.

The first gap is the linkage between Little Rangit River and Manebhanjang block. In terms of tenure rights, there are two categories of forest: government-owned forest and private forest. The government-owned forests are mostly temperate broad-leaved forests dominated by

Cryptomeria with occasional stunted bushes. There are small patches of 'khasmahal' forest (a category of forest that is allocated for public use). Private forests are dominated by plantation of species such as *Alnus*, *Castanopsis*, *Eurya*, *Symplocos*, *Ficus*, *Saurauia nepaulensis*, and *Ficus nemoralis*. About 25% of the area is under agriculture.

The second gap is the link area between Ghoom Bhanjang and Dhooteria block of Wildlife Division I. In this gap, the reserve forests are comprised mostly of temperate broad-leaved forests and plantations separating 'khasmahal', vested forests, and tea gardens. The private lands and vested forests of approximately 0.1 sq.km fall under Darjeeling Gorkha Hill Council and are covered with mixed plantations of *Alnus*, *Acer*, *Castanopsis*, and *Michelia* as dominant species followed by *Eurya* and *Symplocos*. There are patches of plantations of *Ficus roxburghii*, *Saurauia nepaulensis*, and *Ficus nemoralis*. Tea estates account for approximately 0.02 sq.km of land, whereas settlements cover 0.01 sq.km with a few houses. The vested forest linking the two forest blocks of Ghoom Bhanjang of Darjeeling Forest Division and Dhooteria Block of Wildlife Division I, still contains young forests in good condition. This patch of forest now occupied by the villagers could be converted into a community-conserved area with proper motivation and incentives. A narrow belt of forest in the upper reaches of Kusumbing Tea Garden (locally known as Bhalukhop) could be used to link the Ghoom Bhanjang block of Darjeeling Forest Division in the east which, if maintained, would make it a viable corridor.

Corridor II: Senchel to Mahananda Wildlife Sanctuary

This corridor is comprised of more or less continuous montane temperate forests to subtropical wet hill forests. The fringe villages ('khasmal busties') include Middle Mamring, Toryok, Mana Khas, Tham Khas, Ghaletar, Selpo Khas, and Latpanchar Cinchona Plantation, whereas forest villages such as Sixth Mile Busty and Larmat Forest Village are covered by forest protection committees (FPC). Eco-development committees (EDC) cover Jholi, Siltong, and six acres of Cinchona villages.

Along this corridor, there are a number of key seasonal ponds such as Namthang Pokhari, which are important natural habitats for the Himalayan newt (*Tylototriton verrucosus*). The significant feature of this corridor is that it runs along one ridge and both sides of the ridge support good vegetation and connect directly to Mahananda Wildlife Sanctuary without a major bottleneck. Interaction with the fringe villagers revealed that barking deer (*Muntiacus muntjak*), clouded leopard (*Neofelis nebulosa*), jungle fowl, (*Gallus gallus*), and other small animals use this area as their extended habitat. In order to make the corridor secure and also to improve the vegetative cover, supplemental planting in an agroforestry system is required. This is also necessary to provide some economic benefits not only to forest villagers but also to the people living on the fringes of the proposed corridor. It will motivate them to provide shelter for the straying wildlife, and would ensure its safe passage through village areas.

Corridor III: Mahananda Wildlife Sanctuary to Neora Valley National Park

The corridor runs along the three subtropical reserve forest ranges, Chel, Noam, and Neora. Most of these subtropical forests are contiguous and link to Neora Valley National Park. There are two fringe villages in each of the above three ranges which have been institutionalised as

FPCs for effective management of the natural resources. The forests are mostly covered by tropical and subtropical species but, in the upper reaches, some species in temperate forests, such as 'rani champ' (*Michelia doltsopa*) and 'kawla' (*Machilus edulis*) were also recorded. The tropical belt is dominated mainly by sal (*Shorea robusta*), teak (*Tectona grandis*), and lampate (*Duabanga indica*).

There are a number of tea gardens on the fringes of the corridors: Ellenbari, Washabari, Bagrakot, Manabari, and Pathar Jhora. The first two tea gardens have the corridor passing along the boundary of the garden, but in the case of Bagrakot and Pathar Jhora, the corridor passes through the gardens. In the Pathar Jhora abandoned tea garden there is a corridor path where villagers earlier used to grow paddy. There are some wasteland and rock outcrops on the elevated river bed.

Land-tenure system

There are a number of land-tenure systems along the corridors. Reserve forests, which are dominant in all three corridors, are under the control of the Forest Department and under a strict management regime. 'Khasmahal' forests, though owned by the state government, are meant for public use. Most of the private lands are 'raiya' lands (Box 1). They are classified according to their use, such as 'ghareri' (home), jungle (forest), 'sukha khet' (dry agricultural land), 'jhor' (bushes), 'alaichi' (cardamom) cultivation, orchards, 'nali' (drain), 'bato' (road), and tea garden. Such lands are tenanted and the raiya have absolute hold and are given 'patta' defining the area, classification, and so on. To change the classification and use, it is necessary to have the additional district magistrate's (ADM) permission and sanction with a no objection certificate from the management (in the case of tea estates). For 'khasbati' users, rights are as per land classification. Land given on lease to tea estates is governed by the standard lease document.

Socioeconomic and Environmental Implications

The Singhalila National Park-Senchel Wildlife Sanctuary corridor area, being at high altitude, is agriculturally not as productive as other areas, so can be converted into a community-conserved area with the introduction of an agroforestry system. The agro-forestry scheme will bring about change in the monoculture currently being practised, thereby enhancing environmental values with positive economic benefits accruing to the community. The initial

Box 1: Raiya

Defined by the West Bengal Land Reform Act 1955 and subsequently amended in 1981, 'raiya' means a person or institution holding land for any purpose whatsoever. 'Raiya' are not entitled to sub-soil rights and there are certain restrictions to the rights of 'raiya' in Sadar, Kalimpong, and Kurseong sub-divisions of Darjeeling District. The collector, from time to time, gives directions regarding the form of cultivation to be adopted by a 'raiya' or prohibits cutting more than one tree with respect to his plot. 'Raiya' require special permission in writing from the collector or another authorised officer of the state government for any extra benefits from their lands.

cost of re-establishment may have to be provided by development projects, however, with all benefits accruing to the villagers.

In the Senchel to Mahananda Wildlife Sanctuary corridor, re-establishment of a forest belt for corridor purposes will benefit the tea gardens by reducing soil erosion and by conserving and regulating water flow. Some of the potential products that can be exploited to provide income-generating activities are broom grass, oranges, ginger, cardamom, floriculture, and small tea cultivation. A market information system and the requisite infrastructural support are required for marketing the produce. Further, there is a significant number of primary and high schools where environmental awareness programmes can be held to promote conservation of biodiversity among children.

West Bengal Forest Development Corporation (WBFDC) has created an ecotourism resort in the Mahananda Wildlife Sanctuary to Neora Valley National Park corridor on the east bank of the Teesta near Mongpong Forest Reserve. The elephants coming from Mahananda Wildlife Sanctuary on the west bank, cross the Teesta and railway track and take temporary shelter here before moving on further east. In the process, the elephants routinely damage the temporary structures put up by the WBFDC for the benefit of tourists. These structures have to be restored every year at considerable cost. Besides elephants, other animals such as barking deer, wild boar (*Sus scrofa*), jungle fowl, and leopards (*Panthera pardus*) are also common. This ecotourism spot is very popular with people coming all the way from south Bengal districts. Although not an easy proposition, this resort needs to be relocated to avoid the elephant track. Selection of an alternative site has to take many factors into account and will require a detailed survey and enquiry.

Another gap through which elephants move occurs near the army camp at Mongpong near Ellenbari Tea Estate just by the side of NH-31. This narrow gap has a small army playground. The next gap is near Bagrakot where the army settlement has about six small huts. Relocation of these huts would considerably ease elephant movement along this tract. Negotiations have to be carried out with the five households (toribari areas) affected by the corridor and an amicable settlement has to be made. A change in the cropping pattern may minimise man-animal conflicts. The communities should also be trained in biodiversity conservation and be acquainted with animal behaviour. The environmental implication is obvious because of various establishments like the railway, defence establishments, tourist centre, highway, tea garden, and settlements along the natural elephant migration route. Mitigation of such problems will be crucial for restoring the ecology and environment in this region.

Biodiversity Conservation, Tenure, and User Rights in the Light of Local, State, National, and International Policies

Under the Convention on Biological Diversity (CBD) (to which India is a signatory), India has agreed to make an inventory of its biological resources, establish a system of protected natural areas where appropriate, and encourage the landscape-level approach (Secretariat of the

CBD 2005). The Vth World Park Congress similarly recommends that governments, inter-government organisations, NGOs, local communities, and civil society promote participatory processes, communication, education, and public awareness for effective conservation and management of protected areas, and establish biological corridors to link protected areas and facilitate species' migration (IUCN 2005). The importance of adopting mechanisms that foster participation of all the stakeholders involved in protected area planning and management should also be stressed.

The Government of India, emphasising people's participation in the sustainable management of natural resources, adopted the 1988 National Forest Policy. Environmental stability, restoration of ecological balance, and preservation of biological diversity were the thrust areas. The 1988 Forestry Policy clearly indicates the importance of providing corridors to link protected areas in order to maintain genetic contiguity between artificially separated sub-sections of migrant wildlife. In June 1990, a circular was sent regarding the involvement of village communities and voluntary agencies in the regeneration of degraded forest lands and the involvement of committed voluntary agencies and NGOs to motivate and organise village communities to protect, afforest, and develop degraded forest land, especially in the vicinity of habitations.

Throughout the country, as many as 27 state governments have adopted JFM resolutions paving the way for forming joint forest management committees (JFMCs). In West Bengal forest protection committees (FPCs) and eco-development committees (EDCs) have been formed pioneering the movement. Darjeeling Gorkha Hill Council has also endorsed the government notification for the JFM falling under its jurisdiction. Therefore, there are enough policy-level institutional arrangements already in place. The Central Government, along with international bodies like the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP) have to play a proactive role in helping stakeholders develop the corridors.

Framework of Joint Action between Institutions for the Development of Corridors

Eco-development is a strategy to overcome unsustainable and incompatible resource use by dependent communities while enabling them to earn their livelihoods in and around protected areas. Stakeholders' participation is the key to success in eco-development. In the case of corridors, it is necessary to move towards planning for larger landscape levels, and integrating protected areas into regional development plans, basing the entire planning process on collaborative efforts amongst stakeholders. During the last three years, ICIMOD facilitated the development of a strategic document and action plans by the Government of West Bengal: these endeavours were for the purpose of establishing corridors through extensive participatory planning and consultation processes at local, national, and regional levels. Potential conservation corridors linking four protected areas were revisited using GIS technology and land-use mapping for each corridor. On the policy front, local conservation initiatives were adopted with policy implications addressed to national and regional levels and the global

initiatives of the Council on Biological Diversity (CBD). The initiative opened up an avenue for experts and government representatives to visualise and discuss conservation and development concerns within the ambit of national priorities that have regional and global implications.

Conclusion

Making the corridors viable would involve planning for a larger landscape than originally envisaged in the context of an individual corridor. Most of the critical watersheds of the rivers in north Bengal are situated in these hills. Despite the ecological importance of the landscape, it has been subjected to great stress and continues to face multiple threats. Connecting the protected areas with corridors has an important role to play in terms of both vertical and horizontal coverage for conservation of this important landscape. Similarly, establishment of the corridors in an effective manner will have social implications. Wise and sustainable use of biodiversity for economic development could be a promising incentive for local communities. One important area in which economic intervention is necessary is developing livelihood strategies based on options for off-farm income generation. Due attention should be given to indigenous knowledge and an additional focus on building upon existing traditional systems would be useful. So far, livelihood strategies have focused to a great extent on alternatives to forest-based resource use rather than attempting to establish participatory management of resources based on well-defined regulations and principles of sustainability. Livelihood strategies should also reinforce positive interaction of protected areas and people. To alleviate pressure from protected areas, productivity of land and water resources (forests, private land, and government-owned land) needs to increase. Mutually beneficial linkages between economic and ecological concerns need to be built into strategies: however, decisions should be taken on a case-to-case basis and include identification of zones from which regulated use could be allowed without undermining wildlife habitats. In the case of non-consumptive benefits, ecotourism has the best potential but needs to be backed up by supportive policies allowing benefits to accrue to local communities. Successful implementation of the corridor concept will not only help conservation of biodiversity but also motivate forest users to use natural resources sustainably. This, in turn, will help restore natural cover on the degraded and unstable hill slopes of Darjeeling. The watersheds will also receive some protection through reduction in surface runoff, soil erosion, landslides, and floods: this should also lead to an overall improvement in the moisture regime in the hills.

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