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FOR MOUNTAINS AND PEOPLE

# Protected Areas and Payment for Ecosystem Services

## A feasibility study in Shivapuri-Nagarjun National Park, Nepal

### What are Ecosystem Services?

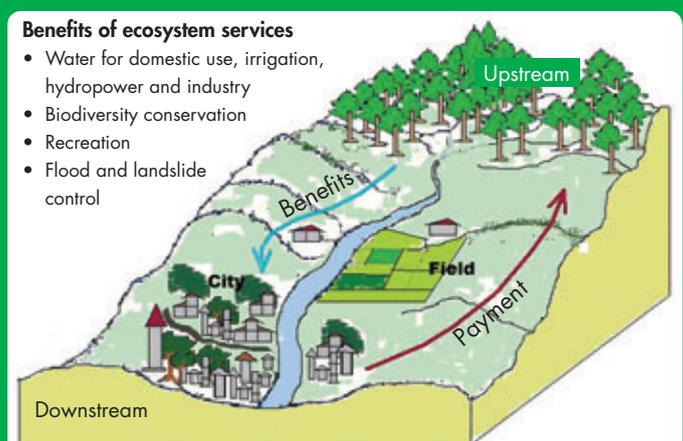
Natural ecosystems generate a spectrum of services that benefit human society and its wellbeing. Forests, for example, in addition to providing goods for consumption such as timber, fuelwood, foods, and medicinal plants, also produce oxygen and capture carbon dioxide from the atmosphere, regulate water flows both on the earth's surface and underground, maintain the quality of water, prevent floods and landslides, and host and safeguard biodiversity, wildlife habitat, cultural heritage, and landscape beauty. Other land use systems in mountain regions such as rangelands, wetlands, protected areas, water bodies, private gardens, and agricultural farms similarly provide a range of ecosystem services.

Protected areas as natural ecosystems provide many essential benefits for human survival and welfare. Forest and water ecosystem services from protected areas in the mountains benefit not only local communities, but also people living in the downstream areas, farmers and urban populations, tourists and the tourism sector, factories and business communities, the State and the international community. Protected areas are global goods in the sense that a number of their benefits reach the global community, for example carbon storage for mitigating climate change through reduced carbon dioxide

levels in the atmosphere, and ecotourism. Mountain protected areas benefit downstream communities through water storage and regulation services and hydropower generation; these hydrological services are significant as the beneficiaries include large populations and industries downstream, including urban areas (Figure 1).

Yet protected area management is mainly centred on biodiversity protection; it rarely considers other ecosystem services, including the goods and services that local communities rely on. While protected area management is complicated and usually underfunded, most benefits from

Figure 1: Flow of ecosystem services that benefit downstream people





## Protected area management issues in Nepal

Protected areas occupy about 23 per cent of Nepal's total area and provide vital ecosystem services including, for example, land stabilization, biodiversity, cultural and aesthetic services, and ecotourism. Most of the river systems in the country originate in protected areas, providing vital hydrological services. The generation of hydropower plays a key role in the country's overall economic development.

Most people living in and around protected areas in Nepal depend on resources from these areas for their livelihoods. But once an area is declared protected, the local communities are often denied access. Hence, conflicts between national park authorities and local communities are commonplace. The national army is deployed to protect national parks and wildlife reserves, and this takes up the largest part of the available budget.

As in most developing countries, the budget available for conservation and protection is generally inadequate for effective park management. Tourist entry fees provide a small proportion of the required budget. Encroachment inside protected areas, conflict with local people, illegal hunting and extraction of forest products, deforestation, and forest degradation are common.

Nepal has no experience of PES in a protected area context, and no national policy framework for PES. The major stakeholders (local people, local institutions, beneficiaries of ecosystem services, and policy makers) lack awareness of ecosystem services and their value. A national policy stipulates that part of park revenue should be shared with buffer zone communities; however, its implementation is inadequate for local communities to see this as payment for their role in enhancing ecosystem services.

ecosystem services are not accounted for. Beneficiaries of ecosystem services from protected areas, such as urban water consumers and hydropower, tourism, and other industries, do not contribute to the management of protected areas or compensate the local communities which often have to live with disadvantages of protected areas, such as economic damage to their crops and property by wildlife and limited road access to markets, hospitals, and other facilities. In economic terms, this is a market failure.

## Payment for Ecosystem Services for Improved Protected Area Management

In recent years, there has been increasing interest in economic approaches, referred to as payment for ecosystem services (PES) or incentive-based mechanisms, in which beneficiaries of ecosystem services provide economic incentives (voluntary or mandated by law) to the providers of the services including park authorities and local communities. In other words, PES is a market-based mechanism. PES schemes may be implemented at different levels:

- watershed level, e.g., downstream users of water (urban populations, hydropower companies, water bottling industries) compensating the upstream land owners or managers;
- national level, e.g., the government-financed PES programmes for forest conservation in China, Costa Rica, and Mexico;
- global level, e.g., payment through the global initiative for Reducing Emissions from Deforestation and Degradation (REDD) to communities and individuals for forest protection and enhancement.

PES mechanisms can be effective in protected area management only when they also contribute to livelihoods and the wellbeing of the local communities. While the concept of PES is emerging as a realistic financing mechanism in protected area management, a lack of clear policies, experience, and confidence in PES is hindering its adoption.



## Scope for PES in Shivapuri-Nagarjun National Park

A PES feasibility study carried out by Forest Action and the International Centre for Integrated Mountain Development (ICIMOD) in Shivapuri Nagarjun National Park, Nepal, revealed ample scope for developing a PES scheme.

Shivapuri Nagarjun National Park lies to the north of Kathmandu, the capital city of Nepal (Figure 2). It is well recognised for its rich biodiversity and watershed services. The national park – particularly the Sundarijal catchment inside the park – provides up to one-third of the piped water supply in the Kathmandu Valley. Water from the catchment is also used for generating hydroelectricity, irrigating paddy fields, bottled water, and the soft drink industry. The catchment is also an important site for both domestic and international visitors who come to enjoy its natural beauty.

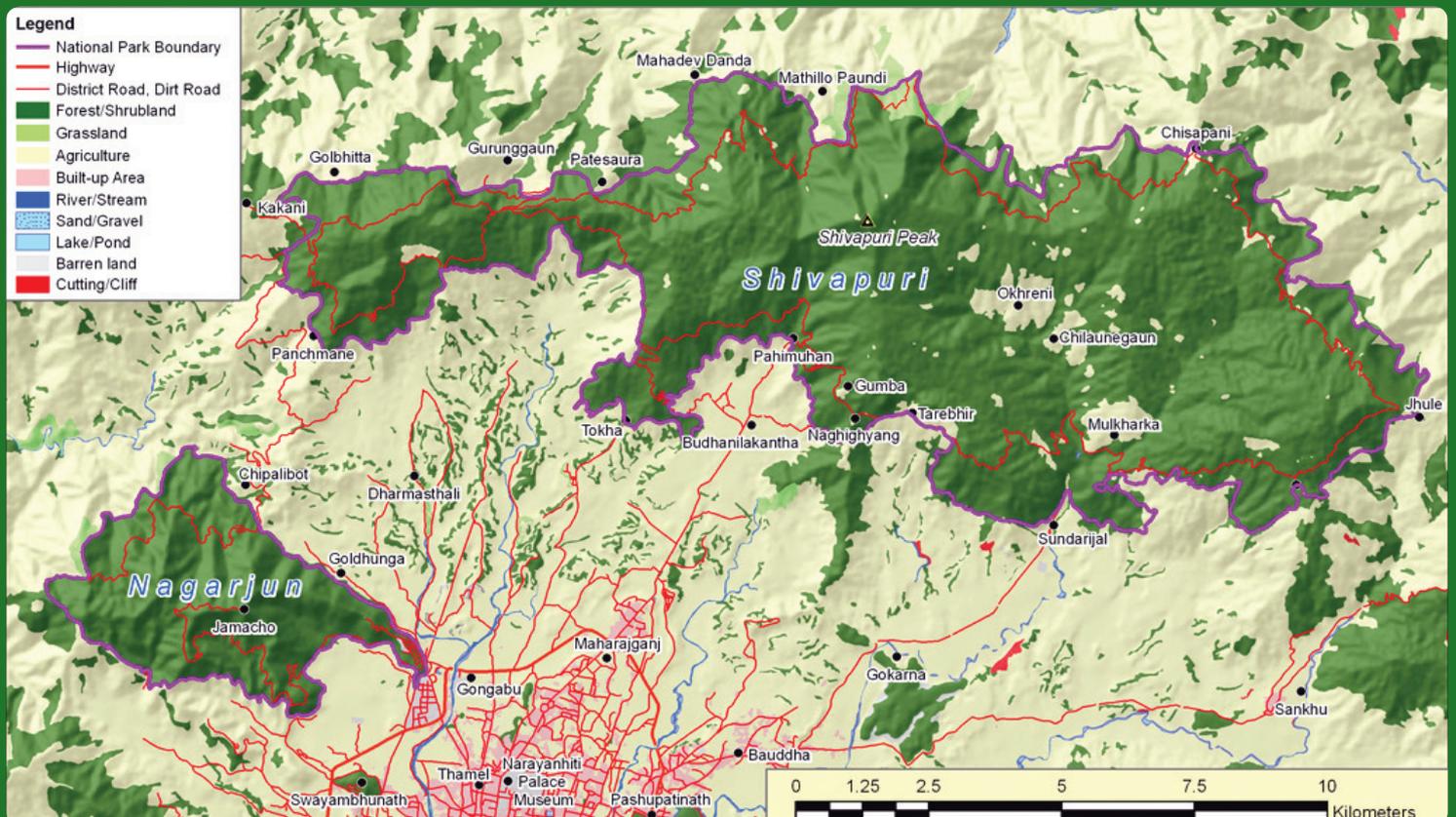
The feasibility study in Sundarijal catchment indicated that people living in the villages inside the protected area are suffering economically, with little trust of and intense conflict with park authorities. With few livelihood options, local people have recently resorted to making alcohol using fuelwood collected from the protected area (both



activities prohibited by law). The government's buffer zone revenue sharing policy has yet to be implemented in Shivapuri Nagarjun National Park.

The study estimated the value of the water services of Sundarijal catchment (all revenue minus expenses for water distribution and electricity generation) at US\$ 870 per hectare per year. The cost of having the national park for the farmers living there (damage to crops and livestock by wildlife, limited access to market) was estimated to be US\$ 498 per household per year. The annual cost to the park authority for managing and guarding the park was US\$ 55.

Figure 2: Map of Shivapuri-Nagarjun National Park, Nepal



A PES scheme (see Figure 3) would collect payment from the water distribution companies, hydropower companies, tourism sector, downstream industries, and paddy farmers that use water from the catchment. The benefits of such a scheme would include economic incentives to local people to assist in conservation and park management, and reduced conflict between park authorities and local communities. Given the economic value of the ecosystem services from Sundarijal catchment, Shivapuri Nagarjun National Park has potential for demonstrating PES as an alternative financing mechanism for managing the protected area.

## Next steps

The following steps are essential to further promotion of PES in protected areas in Nepal:

- review and development of supportive policies for adopting PES mechanisms;

- piloting of a PES scheme, and documentation and dissemination of the process and lessons;
- development of a regulatory framework for implementing PES, using the experience and lessons from local participation and benefit distribution in protected areas in Nepal;
- public awareness building for greater support of PES in protected areas;
- clarification of the roles and responsibilities of multiple stakeholders in protected area and PES management.

A consortium of the Nepal Environment and Tourism Initiative Foundation (NETIF), Forest Action Nepal, and ICIMOD is currently preparing to initiate action research in Sundarijal catchment of Shivapuri Nagarjun National Park, and is supporting activities to enhance stakeholders' awareness of their roles and responsibilities in PES schemes.

Figure 3: Concept of a PES scheme for Sundarijal catchment in Shivapuri Nagarjun National Park

