https://doi.org/10.3126/banko.v30i2.33474

Banko Janakari

A Journal of Forestry Information for Nepal

Ecological assessment and restoration

Ecological assessments facilitate understanding of an area's past, present, and future conditions through comprehensive description of ecosystem patterns, processes, and functions. They synthesize our knowledge on ecological systems, and commonly describe the biophysical and social limits of a system, the interrelations of its ecosystem components, and the uncertainties and assumptions that underlie a given assessment effort. Ecological assessments are not decision documents because they do not resolve issues or provide direct solutions to specific policy questions. Instead, they provide foundation for proposed additions or changes to existing land management plans or regulatory policies, and are a critical component for implementing principles of ecosystem management in land management planning.

Forest ecosystem provides important services both for the animals and birds that live in forest and for humans who use the forest for a variety of purposes. To remain healthy, many forest species rely on periodic disturbances such as wildfire. However, some disturbances, such as deforestation, may instead impair the normal functioning of a forest by increasing soil erosion or by eliminating wildlife habitat. Deforested lands can be, no doubt, restored through reforestation; the reforestation process may include the ecological succession, the long-term evolution of the structure of an ecosystem’s biological community that follows a disturbance event.

Excessive resource use and the associated environmental degradation in the country are responsible for the accelerated rate of natural disasters like soil erosion, land degradation and mass wasting, which in turn are making the ecosystems threatened. Ecosystem degradation is one of the major environmental problems in Nepal. Nepal's ecosystems are very fragile and prone to degradation both inherently and in response to anthropogenic activities. In Nepal, ecosystem degradation, mainly the forest degradation, has adverse environmental and social implications. Rising demand and increasing utilization of resources (timber, fuel and fodder) from forests and grasslands to sustain increasing growth of Nepal’s population is one of the major causes of degradation of these ecosystems. The loss and degradation of forests have been increasing in the Churia and Terai regions during the last few decades. Water erosion in different forms causes loss of huge amount of soil from the Nepal Himalaya. Similarly, wind erosion and chemical and physical deterioration of land are also responsible for loss of soils.

In an effort to conserve critical ecosystems, the Government of Nepal has set aside nearly one-fourth of the country’s area as the protected ones. These areas are not only playing a crucial role in the conservation of diverse ecosystems but also providing a range of environmental, social and economic benefits contributing to human well-being. However, anthropogenic activities have made such areas susceptible to degradation. Protected areas are experiencing overexploitation of resources, unplanned infrastructure development, uncontrolled forest fires, climate change

and pollution, leading to habitat loss and ecosystem degradation. Invasive plant species, such as *Mikania micrantha*, *Eupatorium adenophorum, E. odoratum, Lantana camara,* and *Parthenium* species, are proliferating in protected areas, leading to destruction and shrinkage of habitats of native flora and fauna.

Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any other period of time due to increasing demand for resources (food, fresh water, timber, fiber, and fuel) and advancing technology. In the meantime, efforts of ecological restoration have also been in place. The common understanding of ecological restoration suggests human actions; they fall along a continuum from passive to active corrective options. In the passive option, the ecosystem requiring restoration is left as it is to heal itself through ecological succession, soil building, and colonization of the area by the species that have been extirpated directly or indirectly by humans. In the active option, direct human interventions, such as plantation are applied to the area requiring restoration.

The ecosystem restoration programs and projects as such have rarely been implemented in Nepal. However, ecosystem restoration has long been an integral part of some national priority programs and initiatives, such as community forestry and protected area management programs. The community forestry program, which is considered as one of the most successful forest management programs in Nepal, has been able to restore a large area of degraded forests, especially in the middle hills of Nepal. Similarly, ecosystem restoration activities have been regularly implemented in many protected areas. Restoration of degraded ecosystems has also been integrated into the special landscape management programs like the Terai Arc Landscape, the Sacred Himalayan Landscape, the Kailash Sacred Landscape, the Chitwan-Annapurna Landscape, and various watershed management programs. These various efforts aim to contribute to Nepal's commitment to the Convention on Biological Diversity (CBD) and Aichi Declaration.

Restoration and maintenance of ecosystems in a country require continued efforts; the first and foremost steps for the same include characterization, classification and mapping of ecosystems. In Nepal, several attempts have been made time and again for the purpose. However, the vegetation maps prepared by Dobremez and his colleagues in the 1970s have been the basis of all those efforts. The existing classifications of ecosystem are based on limited field studies of vegetation composition and structure, and analysis of bioclimatic and ecological conditions. In this regard, the Forest Research and Training Centre, under the Ministry of Forests and Environment, with the technical assistance from the UKAID's Policy and Institutions Facility and the USAID's Hariyo Ban Program, has initiated the Ecosystem and Forest Type Mapping (EFTM) Program to standardize the classification of Nepal's ecosystems, and update the related maps based on a comprehensive and systematic study. The Program also aims at assessing ecosystem threats and vulnerabilities. Besides this Program, the FRTC has also been carrying out field studies to identify appropriate interventions to restore the degraded forests in the Churia and Middle Mountain regions. The findings of these research initiatives are expected to support decision making on ecosystem restoration and management across the country through a combined effort of federal, provincial, and local governments.

Editors
Banko Janakari