

## Alternative Approaches to Rehabilitating Degraded Lands in Mountain Ecosystems of Nepal and the Hindu Kush-Himalayas

Damodar Parajuli

### Abstract

This paper enumerates the different categories of land use in Nepal. It outlines the principal causes for the widespread forest degradation that the country is facing. These include encroachment, settlement programmes, shifting cultivation, and logging. The main effects of this degradation are: loss of biodiversity, soil and gully erosion, landslides, and debris torrents. The problems of forest degradation and, hence, environmental change could be reversed by adopting alternative approaches to rehabilitating degraded lands. These approaches include alternative ways of fulfilling daily requirements for forest products; reforestation of degraded lands; and encouraging people to undertake forestry activities. The paper also discusses some of the long- and short-term plans undertaken by HMG/Nepal. However, the main constraints in this respect have been the lack of sufficient finances, restrictive legislation, and the lack of appropriate technology. With the enactment of forest legislation (1992), various NGOs, INGOs, donor agencies, and research organisations are making significant contributions to halting forest degradation in the Nepal Himalayas.

## Mapping of Watershed Afforestation by Means of the Global Positioning System: Land Ownership, Tenancy Systems, Ethnic Composition, and Problems in the Tarbela Watershed Project Area

Bashir A. Wani

### Abstract

This paper presents an outline of the Tarbela Watershed Management Programme in the catchment area of the Tarbela dam. It describes the impacts on the project's various target groups in relation to attitudes, employment, and so on. It details the organisational, technical, and social problems faced by the project. The Monitoring and Evaluation System adopted by the project has succeeded in maintaining accurate information about and assessment of the project outcomes.

The second part of the paper summarises the boundary survey and mapping of afforestation undertaken by the project by using the Global Positioning System. Part three discusses the land ownership and tenancy systems in the project area which are: share cropping, fixed amount of produce, quarter share cropping, mortgage, land rent in cash, and *kalang* (nominal compensation for land/rangeland).

The nomads visiting the alpine pastures of the project area are described, categorised, and the damage to watersheds that their movement causes outlined. In conclusion, a description of the major ethnic groups in the project area is given.

## Rehabilitation of Vegetation under Various Geological Conditions in the Hill Areas of the Dry, Hot Valleys of Yuanmou , China

Yang Zhong  
and Zhang Xin Bao

### Abstract

This paper discusses the rehabilitation of vegetation under various geological conditions in the dry and hot valleys of the hill area of Yuanmouin, China. It describes the physical conditions of the area, i.e., the soil types (haplic and red soil), bedrock (soft mudstone, siltstone, sandstone, metamorphic rocks, and granite), nature of the terrain (gentle slopes, steep gully slopes, and valley plains), climate, and the various degrees of soil erosion under different land conditions. The types of vegetation found in the area at different altitudes are mentioned. The paper describes the relationship between bedrock types and recommends revegetation models that would be appropriate for the Yuanmou area.

## A Preliminary Study of the Key Techniques in the Restoration and Rehabilitation of Degraded Mountain Ecosystems

Qui Xuezhong  
Zhao Xuenong  
and Tang Jianwei

### Abstract

In order to restore and rehabilitate the degraded ecosystem of Nanjian county, various experiments were undertaken which established a number of key factors. The first of these was the choice of three kinds of suitable plant species, namely, plant species for water regulation and fuelwood; plant species for biological fences and checkdams; and plant species for herbage. The second was soil preparation along with a combination of plant community structures. The third was the building of suitable engineering structures to store water and regulate its flow.

The second part of the paper discusses the measures for lessening water loss and soil erosion, and these are: plant platforms, biological fences, biological checkdams, water pits, water ditches, and water caves. Therefore, according to the topography, landform and rainfall, and soil characteristics, these systems can be pursued to regulate and minimise the erosive processes that lead to the degradation of mountain ecosystems.

## SWEET (Sloping Watershed Environmental Engineering Technology) Package for Regeneration of Degraded Lands in the Indian Himalayas

P.P. Dhyan  
and B.P. Kothari

### Abstract

This paper discusses the SWEET package developed by the G.B. Pant Institute of Himalayan Environment and Development, Almora, U.P., India, for regenerating degraded land in the Himalayan region of India and restoring lands in and around the shrines (e.g., Badrinath, Kedarnath, Yamunotri, and Gangotri) of the Indian Himalayas. It briefly describes the scope of this methodology; its target areas (degraded lands, including

abandoned agricultural land owned by individual farmers and degraded community lands owned by villagers); and the elements of the technology package (protection, waste water harvesting, green fodder plantation, crop diversity, and value addition to raw materials, selection of tree species, nurseries, and plantation and soil management).

Rehabilitation of degraded land in and around Badrinath has already commenced under the Badrinath Restoration Programme which is described at some length in the paper.

## **Water Harvesting and Its Impact on Development of the Central Himalayas**

**B.P. Kothyari  
and P.P. Dhyani**

### **Abstract**

This paper discusses the low cost water harvesting technology developed by the G.B. Pant Institute of Himalayan Environment and Development in Almora, Uttar Pradesh, India, and its impact on the restoration and rehabilitation of degraded land and the sustainable development of rural ecosystems in the Hindu Kush-Himalayan Region.

It gives a brief account of the methodology and materials used by the technology and the trial results from six, diverse agroclimatic regions (production of biomass, production of seasonal vegetables, rehabilitation of degraded land, and comparative cost construction for the most affordable water harvesting tanks for villagers). It recommends the appropriate management and use of existing water, both rainwater and spring (surface) water, as a possible and feasible alternative for mitigating the water crisis in the Central Himalayas. The paper also points out the possible limitations to a wide acceptance of this technology.

## **Rehabilitation of Degraded Lands in Mountain Ecosystems of the Hindu Kush-Himalayan Region**

**Keshar Man Sthapit**

### **Abstract**

This paper presents a description of two of the main efforts carried out to assess the status of land degradation in Nepal: the Reconnaissance Inventory of the Major Ecological Land Units and Their Watershed Condition and the Land Resources' Mapping Project. An outline of the main types of land degradation in Nepal is also given.

The second part of the paper deals with the principal factors causing degradation, namely, rapid population growth and use of the land beyond its capabilities. The role of the Department of Soil Conservation is also described.

Part Three discusses the soil conservation and watershed management programmes implemented by the Department of Soil Conservation. These include land use planning, land productivity conservation, development infrastructure protection, natural hazard prevention, and the community soil conservation programme. The paper then gives three examples of rehabilitation work accomplished by the Department. These are the Landslide Treatment at Labok, Biring Watershed in Ilam district; the Sarbang Burrow Pit Demonstration Site, Kulekhani Watershed, and terrace improvement in the Bagmati Watershed. In conclusion, the factors on which the success of rehabilitation depends are enumerated. These are: complete treatment of the area, people's participation, a process-oriented approach, and regenerative conservation packages.