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Resource Conservation & Utilization Project

A Resource Management
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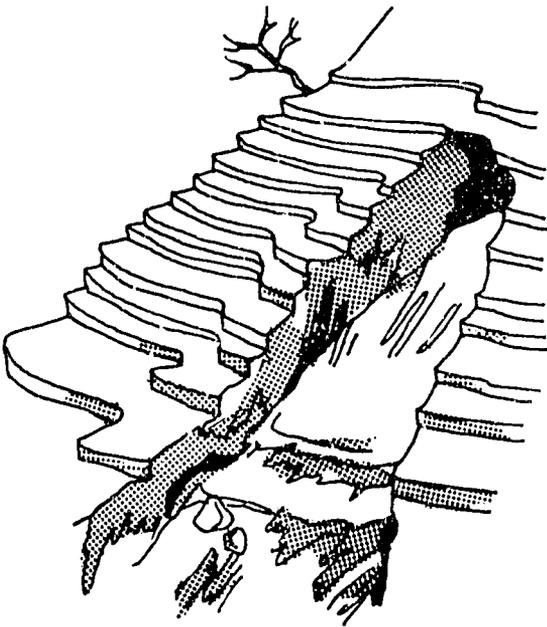
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NEPAL

A LAND IN PERIL



NEPAL IS IN THE MIDST of an environmental crisis. Annually, the monsoon rains wash over 240 million cubic meters of soil from the hillsides and farmlands and carry it to the rivers and floodplains below. Soil losses often exceed hundreds of tonnes per hectare.

Nepal's formerly abundant forests are rapidly disappearing. In the last 25 years over a quarter of the country's forest reserves have fallen to the axe, one million hectares in the last decade alone. The rate of deforestation increases with each passing year.

Much of Nepal's once green and fertile land now experiences cruel cycles of flood and drought brought on by the deteriorating condition of the environment. Rivers rise swiftly during the rains, flooding valleys and plains and sweeping away people's homes and property. Devastating landslides destroy lives as well as livelihood. During the hot season, rivers and springs dry up earlier, bringing suffering to people, livestock, and crops from insufficient water.

The regular assault of the monsoon has always caused problems in this geologically unstable region, but the damage is increasing due to Nepal's expanding population and destructive land use practices. Sadly, countless farmers find that, in the day-to-day struggle to feed their families, they must use many practices that spell ruin for the future. The Middle Hills region of Nepal, stretching

the length of the country, is especially hard hit. Nearly two-thirds of Nepal's 15 million people live in this zone of Himalayan foothills between the elevations of 200 to 2,000 meters. All suitable farmland went into cultivation long ago and, with the population growing by nearly 2.6% a year, many farmers must turn to more steeply sloped and marginal lands for subsistence.

Many human activities contribute to the destruction of Nepal's productive natural resources. Deforestation, for example, has many causes. Forests are cleared to provide desperately needed farmland. A growing demand for firewood, the chief fuel source for over 90% of the people, further cuts into the forests. Trees that are continually stripped of their leaves for animal fodder eventually weaken and die. And people always need wood for building material.

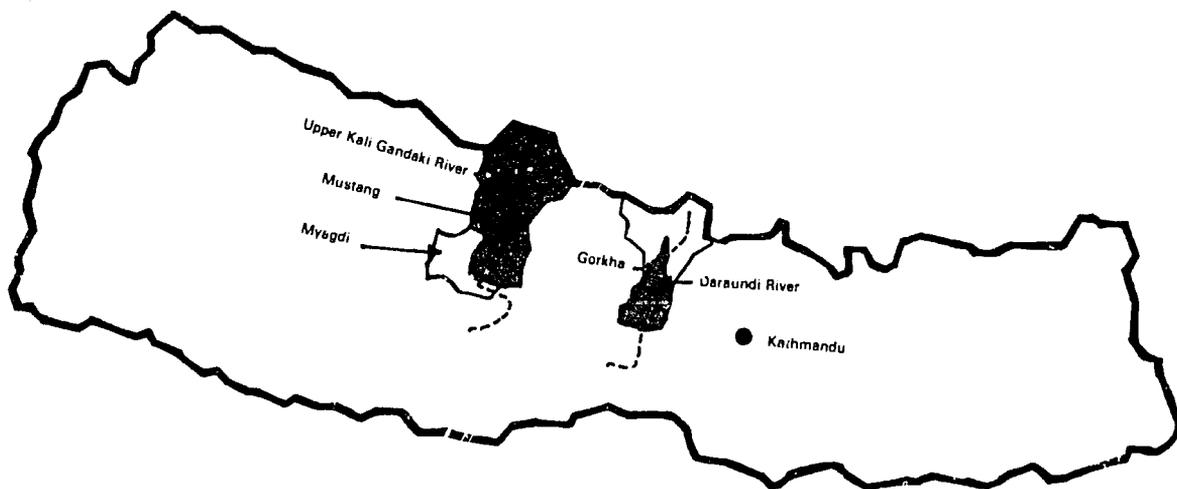
When the forests go, so goes the soil. Composting leaves give back to the soil many natural nutrients. Forest vegetation slows the runoff of rainfall, restricting erosion and allowing water to soak below the surface to be released later to rivers and springs. Erosion, floods, drought, and declining fertility follow the loss of the forests.

Cultivating steep slopes and marginal lands exposes the soil to increased erosion. Landslides and deep gullies can begin to form where the land has been plowed and

disturbed. Surface erosion over wide areas increases, carrying topsoil away. Terraced fields often collapse during heavy monsoon downpours, forcing farmers further upslope or off the land entirely.

As crop yields decline, people rely more and more on their livestock for a living. Cattle, goats, and sheep roam freely over the slopes in search of fodder, stripping the vegetative cover and tearing up the soil with their hooves. Wandering hordes of undernourished livestock and poorly managed pasture lands accelerate the destruction of land and forest.

RESOURCE CONSERVATION AND UTILIZATION PROJECT



HIS MAJESTY'S GOVERNMENT OF NEPAL (HMG) recognized the gathering crisis and approached the United States Agency for International Development (U.S. AID) for help in designing a program to arrest and, where possible, reverse the environmental destruction. Out of these deliberations, the Resource Conservation and Utilization Project (RCUP) was born.

RCUP, the largest and most ambitious integrated resource management program yet undertaken in Nepal, is envisioned as a 15 year effort whose goals are:

- ** PROTECT AND RESTORE THE SOIL, WATER, AND PLANT RESOURCES UPON WHICH NEPAL DEPENDS.
- ** INCREASE FOOD PRODUCTION.
- ** TRAIN MORE RESOURCE MANAGEMENT PERSONNEL.
- ** BUILD THE SOCIAL AND EDUCATIONAL

INSTITUTIONS NEEDED AT ALL LEVELS OF SOCIETY FOR EFFECTIVE RESOURCE PLANNING AND MANAGEMENT.

The Ministry of Forest and Soil Conservation coordinates the overall program, with the Department of Soil Conservation and Watershed Management (DSCWM) as lead agency. Technical assistance for the first five year phase is provided to HMG by the South East Consortium for International Development (SECID), an organization comprising 33 U.S. academic and research institutions involved in helping developing nations the world over.

Following a design phase, field operations began in Spring, 1981. The initial target areas are the Upper Kali Gandaki River Basin in Myagdi and Mustang districts and the Daraundi River Basin in Gorkha District.

RCUP addresses the problems of Nepal's environment across a broad front of integrated activities:

-- Important conservation policy and planning bodies are functioning at the national, district, and panchayat levels of government.

-- Conservation projects are directed toward arresting soil erosion and deforestation.

-- New agricultural and livestock supplies and methods are being introduced.

-- Alternate sources of energy are being promoted.

-- Irrigation and drinking water systems are being built or improved.

-- Integrated HMG office and extension facilities are under construction in district centers and villages.

-- Soil, forest, weather, and other important physical data are being gathered.

-- Resource management training and educational institutions are being expanded.

-- Training programs are upgrading the skills of existing technical staff.

-- Village level social and economic information is being collected and studied.

-- Most importantly, HMG personnel are actively involving the people themselves, without whose participation this nationally important conservation effort could not succeed.

INSTITUTIONAL DEVELOPMENT



INSTITUTIONAL DEVELOPMENT REPRESENTS an investment in Nepal's future, her people. Currently, Nepal has too few resource management personnel to staff a nation-wide program adequately and the country's educational institutions are not prepared to produce the numbers of qualified graduates needed. RCUP is devoting considerable attention and resources to correcting these deficiencies.

For many years, Tribhuvan University's Institute of Forestry at Hetauda has been the chief forest and resource management educational facility in Nepal. Under RCUP, the Institute is increasing its enrollment and redesigning its curricula to improve both the numbers and quality of its graduates. A second campus is under construction at Pokhara, with RCUP engineering assistance and a World Bank credit to HMG. Together they will constitute Tribhuvan University's new Institute of Renewable Natural Resources (IRNR).

The Ministry of Forest and Soil Conservation Training Wing in Kathmandu offers in-service training for existing resource agency staff. The Training Wing also teaches other agencies to design their own internal training programmes. The Training Wing will soon operate a modern facility which will vastly broaden its ability to provide training services in the future.

RCUP's Participant Training Program expands the educational horizons for qualified students and HMG staff by arranging for advanced resource management studies abroad. Many students and staff have already been sent to the United States for degree work at the master's level and for short-term training, and many more will go in years to come. When they return, they will reinforce the growing body of knowledge and skills available in Nepal.

Arrangements are also made for staff and students to attend institutions in India and other countries which are addressing similar resource concerns. Short-term study and observation visits to the U.S. are organized for agency staff and local political leaders in order for them to improve their skills as well as meet and confer with colleagues in their counterpart agencies.

In addition to improving their technical abilities through better education and training, RCUP and HMG are teaching staff how to involve villagers in resource planning and management. Closer interaction with the people will help them build the partnerships essential to Nepal's conservation efforts.

PEOPLE'S PARTICIPATION



ONE OF THE MOST IMPORTANT elements of the entire RCUP effort—and a crucial form of institutional development in itself—is the participation of the farmers and villagers in the program from the very start. When people are involved in conceptualization, planning, implementation, management, and evaluation of projects intended for their benefit, they will build reasonable and realistic expectations about what they can ultimately achieve. Responsible and effective resource planning should spring from the people most directly affected, assisted and supported by agency planners and technicians.

The importance of people's participation to RCUP cannot be overstated. Substantial advances in correcting the damaged environment and improving resource productivity will likely take more than one generation. Village level planning and management, supported by a growing tradition of active people's participation, will insure the continuity and legitimacy of the process.

To encourage people's participation, RCUP has designed and tested a decision-making process called "gaun sallah", or village dialogue. Gaun sallah accomplishes three RCUP objectives at the village level: people's participation, resource integration, and institutional development. Through a series of public meetings, villagers are drawn together and consulted regarding their resource

management needs. The process integrates their knowledge of their own land with the technical expertise of agency specialists who are involved in the discussions from the start. One of the single important products of people's participation using the gaun sallah method is the panchayat Resource Development Plan (RDP). The RDP identifies problems, sets village priorities for resource management, and specifies the physical activities to be carried out. The RDP is prepared as a collaborative effort between the villagers and agency resource management personnel assigned to the area. Successful preparation of an RDP produces the vital local planning device needed by RCUP to move ahead, as well as trains the villagers to conduct their own planning and implementation.

A chain of committees involving citizens and agency staff has also been established, reaching from the village level to the national policy-making level in Kathmandu, further assuring governmental response to people's involvement. The Panchayat Conservation Committee (PCC), composed of men and women representatives from each of the Panchayat's nine wards, is the village decision-making body responsible for examining and responding to the village's resource needs and producing the RDP. The district Catchment Conservation Committee (CCC) coordinates planning for the entire

district, reviews PCC plans, and integrates local plans into the district RDP. The PCCs and CCCs are chaired by the village and district panchayat chairmen and include agency resource staff as active participants.

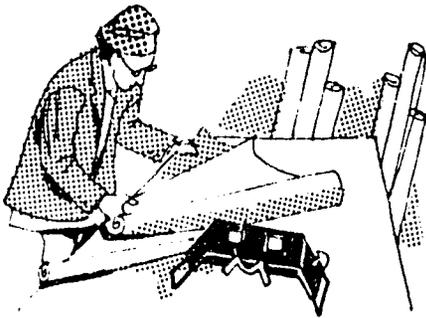
These committees are linked to the National Council for the Conservation of Renewable Natural Resources (NCCRN). The NCCRN is chaired by the Minister of Forests and Soil Conservation and is composed of key governmental and national figures in resource management. This linkage is designed to insure that national conservation policies and programs are responsive to the needs and priorities of the rural residents.

In order to bring its professional staff closer to the people, RCUP is decentralizing a large part of its management structure by building and staffing facilities at the district and village panchayat level. The Catchment Conservation Officer (CCO) is the chief RCUP staff person in the district. From his headquarters in the district center, the CCO oversees all program activities and assists his colleagues in the other cooperating HMG agencies to coordinate their RCUP responsibilities.

RCUP and HMG are making special efforts to see that women and disadvantaged groups are given ample opportunities to participate in all phases of this program. Women provide

over 50% of all labor expended in using the land and its resources. Through their daily work, women have an intimate knowledge of the land, plant, and animal resources in their area. Contributions of women will provide valuable and much needed information essential for effective planning and management. In response to RCUP initiatives, HMG has created positions for their representation on PCCs and CCCs. District and national women's organizations are encouraged to nominate members for these committees. Low income, minority, and other interest groups are also encouraged to participate.

INVENTORY AND MONITORING



INVENTORIES OF DATA on soils, forest and vegetative cover, geology, land use practices, erosion problems, and socio-economic patterns form the foundation upon which sound planning is based. RCUP and HMG specialists spend a great deal of time in the field observing and collecting information about the environment and the problems that afflict it. They test soils, map forest cover, observe agricultural practices, note geological events, such as landslides, and record other facts they need, like stream hydrological data and rainfall amounts. RCUP has also made good use of aerial photographs of the Kali Gandaki and Daraundi River catchments for resource surveys.

Monitoring is a continuous process of data collection. Gathering information regularly over long periods of time from specific locations helps RCUP staff determine the nature of the problems they are addressing and the effectiveness of various conservation strategies. For example, regular monitoring of sediment production from run-off test plots can show the value of different ground covers in reducing erosion.

An important part of Inventory and Monitoring is assembling social and economic information concerning the people in the project areas. RCUP social scientists and other staff meet with the villagers to determine traditional land use practices, social structure, decision-making customs, trade patterns, leadership, and the people's own perceptions of their problems and needs. This information, along with the physical data about the land, is vitally important in introducing RCUP to the villagers and involving them in the program.

RCUP Sub-projects

WHILE LAYING THE FOUNDATIONS for improved resource management for the future, RCUP is moving ahead simultaneously with projects to meet immediate needs. Ten sub-projects that are integrated and mutually supporting have begun the task of restoring and protecting Nepal's productive natural resources.



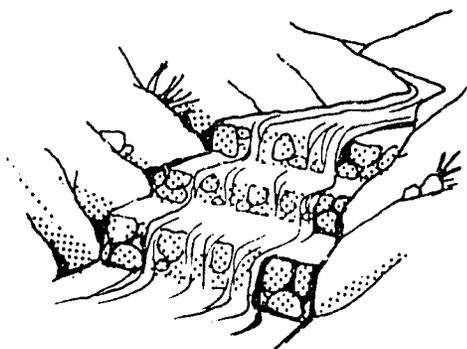
Forest Management

The Forest Management sub-project aims to increase fuel, fodder, and timber while reducing run-off and soil erosion. Nurseries are being built, trial plots planted, and management plans drafted for community, national, and private forests.

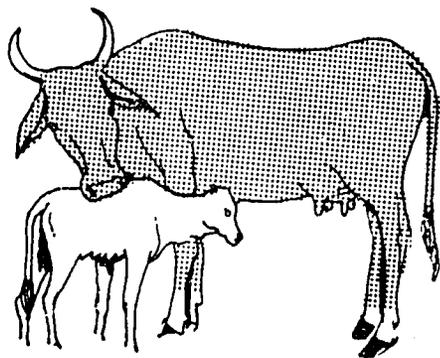
Nurseries are producing seedlings for reforestation, new forests, and plantations. Forestry extension is an important part of this sub-project. District nursery personnel and RCUP/HMG forestry staff assist villagers in starting their nurseries and plantations and other improved forestry management practices.

Watershed Management

The Watershed Management purpose is to reduce the many types of soil erosion



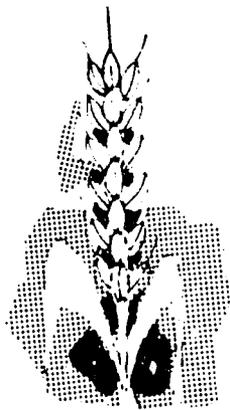
occurring in Nepal while at the same time improve agricultural productivity and water quality, reduce flooding, and help maintain a more even water supply throughout the year. Specific activities include reinforcing field terraces, building gabions to control gullying, improving trails to prevent erosion, stabilizing road slopes and streambanks, planting trees in flood plains, building catchment ponds, anchoring unstable slopes with trees and vegetation, and protecting water sources. Climate and stream-flow data are also collected to help in designing and implementing appropriate control measures.



Community Livestock

The long-term objectives of Community Livestock are to reduce the environmental damage caused by domestic animals on forest and grazing lands through better range management and animal husbandry and to improve people's nutrition through increased animal product yields. This is being accomplished through improved animal feeding practices, better animal health, breed improvement, and new methods of animal and land management. Animal health is being improved through immunization and parasite

control. Breeds are being upgraded with new varieties of cattle, goats, buffalo, sheep, and poultry. Livestock sub-centers and extension agents bring animal husbandry and health services closer to the people and their herds.



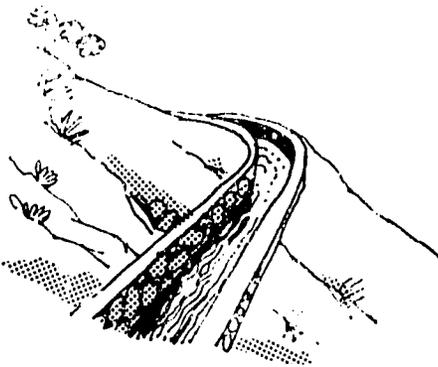
Agronomy, Research and Extension

The Agronomy sub-project is tackling falling crop yields to increase food production and nutrition. Increased harvests from higher yielding varieties will reduce the need to clear and cultivate marginal lands. Improved farming practices will arrest soil loss and restore declining fertility. New strains of wheat, rice, maize, and other field crops are being introduced through extension activities, farmer training, and distribution of seed demonstration mini-kits. Varietal testing and storage trials are also being conducted. demonstration mini-kits. Varietal testing, seed storage trials, and cropping farm system trials are also being conducted. Agricultural sub-centers are being built and village extension agents trained to help farmers reap more from their land.



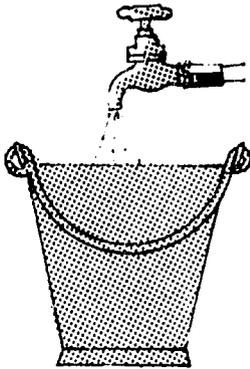
Horticulture

Horticulture concentrates on increasing nutrition through fruit and vegetable production. District and panchayat nurseries are producing improved fruit tree seedlings and vegetable seeds. Vegetable seed mini-kits have been distributed in many areas. Extension activities demonstrate storage and food preservation techniques. Intensive fruit and vegetable cultivation can supplement deficient diets as well as use marginal lands without increasing soil erosion.



Irrigation

The Irrigation sub-project directs engineering and financial assistance toward building new irrigation systems and improving old ones. Properly designed systems supplying water from perennial sources to good land reduces the need to use less suitable, more easily eroded areas. Reliable irrigation also extends the growing season allowing multiple cropping in areas previously dependent solely on rainfall. RCUP and HMG staff assist in the design and construction of these projects and help establish local user groups and maintenance systems.



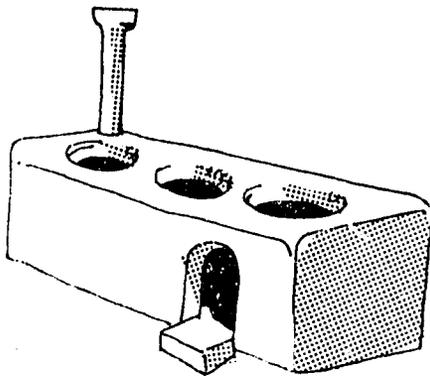
Drinking Water

The Drinking Water Project is building new water systems and improving inadequate ones to collect and pipe water from safe, permanently flowing sources to village taps. Village drinking water sources are often open to contamination and situated far from people's homes. Frequently they cease flowing completely during the dry season. These improvements will insure more constant delivery and contribute to better public health by providing a more protected supply. The more conveniently located taps also free women and girls from long hours spent in carrying heavy containers of water from distant sources.



Community Fisheries

Community Fisheries projects have become popular and profitable among the Terai residents of Nepal and are now being looked into as a new source of protein and income for hill communities. Several small projects and local incentive programs are being pursued in a number of hill areas to take advantage of multi-purpose impoundments being planned or already under construction. RCIP will study the biology and water supply of these ponds and recommend plans and suitable fish species.

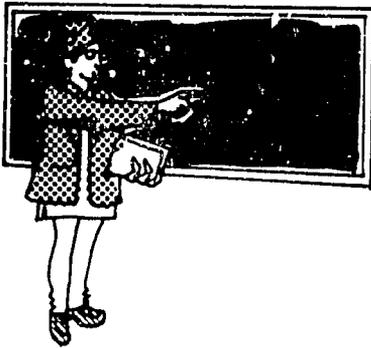


Energy Alternatives

The Energy sub-project seeks ways to reduce dependency on firewood by broadening the energy mix available to the people. Fuel efficient and properly vented chulos that can be manufactured locally of clay and stone have been introduced successfully to many homes. More powerful and efficient water turbines have been designed and are available for installing at appropriate locations for grinding grain, extracting oil, and generating electricity. A combination bio-gas and diesel fueled grain and oil mill has been built in Gorkha District. RCUP energy staff conduct demonstrations in the field to promote an interest in using alternate energy sources and to identify district offices and agencies that can provide assistance and information.

Training

RCUP is heavily committed to upgrading the long-term capability and professional calibre of Nepal's resource management personnel. The Institute of Forestry at Hetauda is expanding its enrollment, increasing its course offerings, and designing curricula for the future. RCUP and SECID advisors are



teaching many of the classes until sufficient numbers of qualified Nepali teachers are available. Tribhuvan University and RCUP staff are completing the overall program structure and operating philosophy of the Institute of Renewable Natural Resources (IRNR). The Institute is actively seeking women candidates for student positions being reserved for them. The Ministry of Forest and Soil Conservation Training Wing, based in Kathmandu, provides in-service training for HMG agencies. The Training sub-project also identifies and sends promising students and staff abroad for advanced study in resources management.

THE CONCLUSION *- A beginning*

NEPAL'S ENVIRONMENT AND NATURAL RESOURCES have suffered serious damage and the problems continue to grow. It has

taken years to reach the crisis point the country finds itself in today. It will take many more years to begin seeing some improvement with even the most far-reaching programs. The Resource Conservation and Utilization Project is an ambitious beginning and an utterly necessary undertaking for the country and people of Nepal.

The challenges are enormous; uncontrolled soil loss must be checked; many traditional farming practices must change; educational institutions must be upgraded; hundreds more resource management personnel must be trained and placed in the field; HMG must deploy the material and technical services promised to the villagers; and, most importantly, the villagers themselves must participate and learn how to incorporate good resource planning and management into their daily lives.

The population of Nepal will nearly double during the projected lifespan of this project. The generation is being born today who will bring their own children into either a self-sustaining environment or an eroding desert of barren hills. HMG, RCUP, and the people of Nepal have begun the work that can prevent the realization of that bleak vision of the future.
