

ENHANCING LIVELIHOODS THROUGH INTEGRATED WATERSHED MANAGEMENT

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Nepal is a mountainous country covering about 83% of its total area under rugged mountains and hills and only 17% of Terai region (Terai, plain region having fertile land, suitable for agricultural practices, is situated in the south part of the country stretching from east-west along the Nepal-India border). It is experienced that most of the watersheds in the country are in physical and biological deterioration due to overgrazing, deforestation, inappropriate agricultural practices and improper uses of natural resources.

Over two-third of Nepal's total land area falls under the watersheds of the major river systems viz. Koshi, Gandaki and Karnali with more than 6000 tributaries. Of the total watershed area of the country, about 0.4% is in very poor, 1.5% in poor and 11.7% in fair, whereas 32.8% and 50.6% in good and excellent conditions, respectively.

Sukauri-khola (khola stands for torrent in which a large amount of water flows very fast washing sands, gravels, boulders and other materials on its way during the monsoon season and very little or no water during the rest of the year) is not an exception of all these watershed problems. Sukauri-khola micro-watershed (S-KMW) with a total area of 55 ha, is located in the ward number 7 of Bidur municipality in Nuwakot district. It is situated at an elevation of 470 m from the mean sea level and 72 km north-west of Kathmandu, the capital city of the country.

The village had enormous socioeconomic and soil erosion problems. Horrible fingers of deep gullies and landslides were stretching towards the farmland and had the potential to approach houses in the future. During the first visit to the village in February 1994, the office staff met two-three farmers who talked them much reluctantly. It was because they had perception that the government staffs approached them for their own purposes, not to serve the resource-poor farmers. After a series of meetings and discussions, 31 males and 17 females looked motivated and willing to participate in the program implementation forming a Sukauri-khola Soil Conservation Users' Group. Constitution with appropriate rules and regulations was formulated.

The program was started with an objective to improve the land use system of the micro-watershed in reducing soil erosion problems and enhancing livelihoods of the occupants through integrated watershed management practices.

The S-KMW is comprised of two indigenous ethnic groups; namely, Kumal (98.84%) and Majhi (1.16%). There are 68 households residing within the micro-watershed with an average size of 6 people per family. The male-female ratio is 1:1. The literacy rate has increased from 3.2% in 1994 to 26.22% with 46% male and 54% female in 2007. The present statistics on education shows that none of the boys could pass class ten until now. The landholding of the family ranges from 0-0.25 hectare. These families are directly dependent on subsistence agriculture occupation. Even in the scarce of irrigation water, per ha production of rainfed crops grown in the sandy soil such as Corn, Niger, Soybean, Ginger and Turmeric was found increased, which might be due to enhanced soil fertility. Nowadays, farmers have started growing leafy vegetables in the kitchen garden during rainy season.

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The following guiding principles were followed in the management and development of the Sukauri-khola micro-watershed: 1) Trust building: applies that stakeholders with whom watershed management activities are to be implemented must be convinced that the outsiders went to help the farmers; 2) Holistic and integrated watershed management: applies that any watershed management activity, including occupancy and farming system within the watershed, will have immediate or long-term impacts on the soil, water, vegetation and other watershed natural resources; 3) Multiple-resource uses: depends on the concept that the watershed can be managed to deliver a significant number of goods and services to the community; 4) Multi-sectoral watershed management: Since the watershed is comprised of several resources to be used by various stakeholders, the multidisciplinary and participatory approach of watershed management must be practiced; 5) Sustainable watershed management: aims to provide continuing benefits to most of the beneficiaries for both the present and for the future generations; 6) Community participation and equity: recognizes and promotes the “sense of belonging/ownership” among various users in watershed management applies not only on the aspect of their involvement/participation in implementation but also on the equal sharing of benefits and responsibilities; and 7) Financial approach: Since financial aspect of any project is one of its major strengths for success or failure, a simple and very transparent system of managing community fund must be established at the very beginning.

After the formation of users' group, a bank account was opened to deposit membership fees, the earned money from the sell of grasses and the saved money after implementing of soil conservation activities with an objective of creating a community fund to be used as “soft loan” for the welfare of the stakeholders. The community has saved more than US\$ 1700.

In addition to soil conservation and integrated watershed management activities agriculture based income generating activities were implemented in coordination with local level government line agencies, Peace Corps/Nepal, JICA sponsored Water Induced Disaster Prevention Project and local NGOs. Varieties of plant saplings were planted in the course of gully, landslides and public naked lands. In order to enhance soil moisture content, sloppy lands were improved by constructing terraces. About 20 ha of the total area were covered with grass/fodder, timber and fruit trees. Most of the community and private lands were covered with native shrub such as *Agaves americana*, *Bambusa sp*, *Cynodon dactylum* and *Stylosanthus guianensis*, *Melinis minutiflora*, *Pennisetum purpureum* and *Wthysonolaera maxima*. Fodder/timber and fuel-wood tress includes *Aegle marmelos*, *Melia azedarach*, *Ficus lacor*, *Dalbergia sissoo*, *Acacia catechu*, *Pinus roxburghii* and *Shorea robusta*. Fruit tress includes *Mangifera indica* 10.65 ha, litchi 4.06 ha, coffee 1.5 ha and jackfruit 0.5 ha and *Musa sapientum*. Farmers have an annual selling of mango and litchi worth of US\$ 4600. *Asparagus* cultivation is being practiced in 0.1 hectare of the degraded land with an objective to increase family income. Gullies and landslides have been plugged and stabilized by constructing brushwood checkdams, dry-stone checkdams and G. I. wire checkdams.

The Sukauri-khola integrated micro-watershed management program is solely based on community participation for sustainable management and development of natural resources for poverty alleviation of the resource-poor community. Trust building is the first challenging task for an intervener to take the stakeholders in faith. If the poor community realizes that the outsiders went to serve local people, they could whole heartedly participate in any development activity. The Sukauri khola's occupants have successfully overcome the watershed degradation problems by implementing income-generating and bioengineering based watershed management activities.

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