

5. Responses of the Community

The changes in the surroundings of Bhardeo, such as the pressure on forests as a result of increasing urbanisation in the Kathmandu Valley, serious degradation of the natural resource base (especially farmlands and forestlands), as well as the constant fight against dire poverty, have been affecting and further weakening the local economic-ecological system.

Contrary to popular assumptions, the people of Bhardeo appear to be aware of ecological degradation and are regulating their use of local resources within the limits of economic imperatives. The Bhardeo community had adjusted in every way possible to them. The responses to economic and ecological losses over the years had been at the level of individual households, e.g., awareness of environmental problems, acceptance of the reduction in forestry biomass, lowering of labour inputs, opting for smaller livestock, and reviewing the population pressure on a seasonal basis by migration?

Awareness of Environmental Problems

The people of Bhardeo are more conscious than ever before of the importance and vulnerability of their natural resources, such as forest vegetation, farmland soils, and water, because of the catastrophic floods that caused loss of life and property in September 1981.

The community has tried to understand the diverse effects of these incidents on the general environment. The farmers were aware of their precarious situation and were as concerned as any expert would be. They tried to relate the catastrophic events of 1981 to the decades of deforestation that had preceded it. They attributed the 1981 incident to factors such as:

- a. a holy curse;
- b. degradation of the forest and loss of trees in general;
- c. increased use of slope areas for farming; and
- d. charcoal production and man-induced forest fires to clear forests and lure animals to new open areas for hunting.

The opinion of the community was strongly based upon the problems it had encountered. The negative effects of over-exploitation of forest resources in the area were held to be mainly due to the rampant poverty that had continued over a long period of time.

It was difficult for the people of Bhardeo to separate environmental problems from economic ones. Job opportunities for generating income based upon activities related to nature management were considered to be vitally important. These activities were reclaiming farmlands damaged in the 1981 floods, planting vegetation on the slopes, protecting farmlands and forests, and strengthening the road alignments.

The Community's Responses

Adjustments in Quantity and Quality

In every system of resource management, the local people must notice and respond first to the changing circumstances before outsiders start taking notice of the changed situation. The people of Bhardeo, too, made different adjustments to their system, which, in the given situation, met with varying degrees of success.

However, due to the economic hardships faced by the community, the responses to the changes in the resource base did not lead to enhancement of the resources but rather to subsistence behaviour.

Less Reliance on Forest Resources

More time was required to collect a smaller amount of biomass. This provided another reason for the Bhardeoli to consciously plan their animal population, i.e., the constraints felt in the supply of fodder and feed resources. Fodder was not available in adequate quantities and at the required time. As resources became less accessible to individual user households, they took a longer time in comparison to the past to collect even a small quantity of biomass. One of the

most conspicuous strategies followed by the farmers to counter the unfavourable situation was to **opt for smaller quantities of forest products such as fodder and firewood.**

One major reason for this shift was that the forests in Bhardeo had undergone many changes over two decades. The time allocated for collecting fodder and firewood had increased by two to five hours per day. Because of the labour constraints over the dry period, and decrease in tree productivity in general, the system tried to rely less on forest resources for fodder. Within one generation, the community seemed to have succeeded in reducing dependence on forest resources by 60 to 75 per cent.

Low Labour Input

Earlier, when the abundant resource base was located within easy reach, higher labour inputs over a shorter period could fulfil a day's biomass requirements. Subsequently, farmers had to face constraints in mobilising labour for the same amount of biomass because of the steady depletion of this resource base. Hence, their response to this change was to **allocate, on an average, only one-third of the labour time for the same.** This naturally helped to reduce the volume of biomass collected in a day, which facilitated the first strategy. But even this strategy had to be complemented by other measures, such as controlling and varying the structure of the ruminant population, controlling the frequency, and scheduling lactation, all of which had a direct bearing on milk production.

Rearing Different Animals

According to the farmers, rearing large livestock, such as buffaloes, was becoming difficult. In recent years individual households had reduced their livestock holdings and had **replaced large livestock with small ruminants.** Acute food shortages had made it uneconomical to rear pigs because they compete with man in terms of food consumption. Sheep rearing was avoided, apparently because of the negative grazing impacts caused by this animal on steeper slopes.

Cattle population growth was maintained below one per cent. On average only about six per cent of cows lactated compared to 25 per cent of buffaloes. This was directly related to the fact that the disposal of old cattle was a problem that did not occur in the case of buffaloes and goats. So growth in the population of buffaloes and goats was planned to coincide with the peak demand period during

the main festivals in October/November, before the onset of winter.

Bull-servicing and mating were arranged in such a way that calving coincided with the harvesting season between August and November. The lactation period covered the seven to eight months when vegetation flourishes, thus providing an adequate supply of fodder.

Migration and Off-farm Activities

In Bhardeo, the population was unable to sustain itself for the whole year. One of the consequences had been **seasonal out-migration for off-farm incomes, especially during lean periods in the dry season.** Off-farm incomes from seasonal migration did help the system to some extent. A few households had permanently migrated to other areas.

Dependence on the Market for Staple Grains

The nutritional status of the people was poor and food management a serious problem. Over 86 per cent of the population could only grow sufficient food to last them for about six months. For the remaining period, the food deficit had to be met from off-farm incomes. In a normal year Bhardeo purchased up to 50MT of maize before the onset of monsoon. This hardly covered the total deficit and thus under-nourishment was widespread

The environment in Bhardeo was one of extreme poverty, and this situation could continue for years to come. What then should be the kind and quality of development? Had no major constraints and issues of development existed, the economy and ecology of Bhardeo would have been quite different today. Are the issues of development found in Bhardeo unique? To some extent, the problems discussed in the next chapter may be widespread in these mountains.

Institutional Responses

A large sum of money was invested for a watershed management programme in the Bhardeo area. According to the local people, the work mostly involved engineering structures and was undertaken by labourers from outside the community. The resources mobilised to carry out plantation in the hope of increasing forest cover seemed to be higher than the resources allocated for the preservation or conservation of the existing natural forests in the area. Resources were wasted during the implementation of

programmes, mostly implemented directly at the central project level, such as checkdams and bridges. This did not contribute towards motivating and enhancing the competence of local leaders and had discouraged the growth of development oriented institutions.

The few joint programmes of government and other agencies in collaboration with local institutions were very recent ones and were concentrated in service sectors. They included family planning, women workers, community health, and mother and child care centres (catering for five former panchayats too) under the Women's Services' Coordination Committee (NGO). It had an annual budget of 11,000 rupees and employed six women with average salaries of Rs 375 per month. The contacts were infrequent and they had not been of the quality to be appreciated by the local community.

The traditional institutions, which looked after water and forest resources, had been weakened while the modern, politically-based ones, such as the village panchayats, were too weak to respond to local demands. Very little work had been carried out on resource base management to increase incomes, without which environmental management in the area would become ineffective. Many of the afforestation programmes had become unresponsive to local needs. More than 90 per cent of the tree saplings grown in the local nursery were *Pinus* sp., *Populus* sp., and *Grewia robusta*.

The management of forest resources would have been better if the local people had been directly involved in the protection of forests. The roles of outside agencies should have been one of catalysts and resource mobilisers for the creation of essential institutional supports to the people (such as agricultural, veterinary services, marketing and watershed management, and other government services).

The question is, what should be the criterion for allocating resources for environmental management? political clout, or economic potential, or ecological priority (such as a watershed); number of voters, economic leverage, geographical dimension, or strategic location? Which of these criteria are important in the case of Bhardeo? **Being a small community, both in terms of its geographical size as a very small mountain watershed and in terms of it having a small and poor voting population, seems to have disqualified it from receiving external inputs.** Resource

mobilisation for economic development in the mountains remains a controversial issue.

The high mortality of household animals (Table 14) has direct and indirect implications for farmland productivity and also for farmland fodder production (by-products and green farmland residues), as a result of reduction in the soil nutrients available in FYM - resulting in high economic-ecological loss.

The problems of animal husbandry in Bhardeo were interlinked with other socioeconomic-ecological problems. Livestock, which is a crucial link between the different natural resources of the mountain farming systems, should not become the scapegoat for environmental problems!

In August 1988, a veterinary service centre was set up, manned by a Junior Technical Assistant (JTA) and a peon. Because of inadequate supplies of medicine, tools, utensils, and equipment, as well as lack of training, the staff was not in a position to render the services required. The medicine was allotted by the district veterinary centre located at the district headquarters, and the supply was augmented every four months; this only catered for 25 per cent of the cases. The staff member was ill-paid and inadequately trained.

A goat improvement programme was introduced with a single *Jamunapari* he-goat, although this programme had not been requested by the farmers. But the choice of breed and the way it was reared left much to be desired. The problems resulting from the cross-breeding of local, small-sized goats with large *Jamunapari* was very serious. In 1988, several cases of labour complications were reported. A less popular programme was poultry breeding, especially of improved breeds. Yet five households took part in the programme at a high cost. Mortality was high (one of the households had a mortality rate of 40%).

The livestock development programme became a serious credit burden on farmers in rural areas. It had been more a result of the "push of the banks" than of the "pull by the farmers" for the money which would be required by them for many other development activities. Despite these responses, which can be regarded as a great sacrifice on the part of the community, the community had come to realise that the basic issue for them was to address their situation of dire poverty.