

SUMMARY AND CONCLUSIONS: POLICY IMPLICATIONS

The economy of the Hindu Kush-Himalaya Mountain Region of Asia is dominated by a rural sector based exclusively on agriculture. Although the linkages have only recently started to be understood, hill agriculture is heavily dependent on trees and forests.

The analysis of the inter-relationship of forestry with agriculture and livestock husbandry shows the need for integrated management of resources in mountain watersheds and the important contribution forestry is making to hill farming economies in the Region. An attempt has also been made to analyse whether forestry can play a role in the economic and social development of the rural people and thus establish the place of forestry in development. This is a difficult task because forests in the HK-H Region have never stood apart as a separate sector in so far as they have always been closely interwoven with other land uses and with social, economic, political and demographic change in a country.

In the past decades the Region, besides being a political hotspot, has become the object of growing environmental and socio-economic concern. Environmental deterioration, which has attracted increasing attention, has resulted from increased competition for scarce resources. This competition is represented by several levels of conflict such as heavy human and animal pressures, national goals versus local interests, competition for forest and mineral resources between rural subsistence farming communities and urban commercial enterprises, etc.

The forests in the Region represent one of the most important land uses. They sustain the hill farming system by supporting agriculture and livestock husbandry in these hill areas. Their contribution to the hill farming economies is very important and substantial. They are, as a result, also subject to heavy human and animal pressure. Forests support agriculture and sustain the hill farming system directly by supplying fuelwood, fodder, leaf litter, poles and timber, etc., to the rural

population. These products of the forest are generally obtained by the local people as free goods.

The pressure on forests to meet the demand for these products, therefore, is ever increasing. The forests are in the process further degraded and may ultimately disappear. The ratio of forest to agricultural land at present is very low, resulting in overgrazing of forest floors, damaging and destroying seedlings, thus inhibiting forest regeneration.

Poorly stocked forests with very low productivity are not only unable to meet the daily needs of the local people in terms of fuelwood, fodder, leaf-litter, timber, etc., but are also less effective in conservation of soil and water which is widely perceived as one of the primary functions of forests in mountain watersheds. Some of the forestry practices taken up in support of agriculture, horticulture, etc., are damaging to the standing trees, damage and destroy regeneration and other undergrowth and cause serious soil erosion.

Deforestation and sometimes the use of faulty forestry and agricultural practices, have led to soil erosion, loss of soil fertility and ultimately to the loss of cultivated land. Developmental pressures such as road building and high dam construction activities in these mountains have aggravated the problem. The resulting enormous run-off and accompanying soil loss during the monsoon not only causes reduced agricultural production in upland areas, but also results in siltation of reservoirs and floods and poses a serious threat to agriculture down stream. Thus, for the protection of agriculture and the wider environment, the integrated management of whole watersheds becomes essential. Forestry through its protective role in these watersheds also, therefore, makes a major contribution to the hill farming economy of the Region.

Declining land:man ratio is the most fundamental problem of development in the predominantly rural hill areas of the Hindu

Kush-Himalaya with the economy based exclusively on farming. Declining farm productivity is the root cause of the hill farmer's problem. A number of options have been tried which, however, fail to adequately address the basic problem.

Farm productivity in the hills is declining due to the high level of dependence on forest, low forest to agriculture land ratio and declining forest productivity. The farmers need cash for various purposes. The decline in farm productivity means widening of the gap between the hill peasants' farm income and needed cash and results in growing tension within the hill farming economy. Enhancing the hill farmers' income, therefore, becomes the most important consideration.

There are, however, problems in enhancing the hill farmers' income. The problems faced by them in this connection are, in general, related to a dwindling resource base and deteriorating local environment. The hill farmers try to make up the production deficits due to declining farm productivity and augment their cash income through extension of agricultural land to marginal areas, intensification of agriculture and adoption of improved technology, resorting to off-farm (casual, seasonal or permanent) employment, or by migrating to urban or newly opened-up rural areas.

How much land is still open for agricultural extension in the hills is a controversial question. However, it is clear that crop-yield per unit area of cultivated land has been declining which has forced the hill farmers to look for other options. The farmers have been compelled to raise the cropping intensity on available land in order to produce maximum food supply every year from their small holdings. However, these intensified crop production activities also continue to follow the traditional agricultural practices in which human labour, animal draught power, farmyard manure and monsoon rain water are the main inputs. The adoption of new technologies and inputs to maximize food productivity per unit of cultivated area has been constrained mainly by the hill farmers' economic inability to buy these. The characteristic features related to employment and income structures in these hills are: a very high proportion of the population still occupied in rural occupations dependent upon agriculture, abundance of labour against a scarcity of skill, low levels of industrial development and limited employment oppor-

tunities, the State as the major employer and a remittance economy. Out-migration is yet another way by which the hill farmer responds to declining economic conditions due to population pressures and environmental degradation. The attractions of off-farm employment opportunities and opening up of the lowlands for agricultural colonization are among important factors that encourage out-migration. Some form of cash income must, therefore, be derived by the hill farmers, as far as possible locally, to make up production deficits and contain the growing tension within the hill farming economy.

Forestry, through appropriate investments, could contribute to the hill farming economies in a number of important ways. Forestry development activities and the promotion and development of forest based and allied cottage industries, handicrafts, and cash crops have a high potential for creating off-farm employment and income opportunities for the hill rural population within the Region itself. This is evident from the few case studies examined.

People-oriented forestry development activities, such as the protection and improved management of existing forests and the forestation of denuded areas through the involvement of local people, have particularly high potential for creating off-farm employment and income opportunities for the rural hill people, while also supplying their basic needs and reducing environmental deterioration.

Development of non-wood forest products and minor forest products such as mushrooms, fruits, nuts and berries; medicinal plants; bee-keeping, etc., have high potential of creating off-farm income opportunities for the people in these mountains.

Similarly, promotion and development of bamboo and bamboo products, sericulture, etc., and small scale cottage industries dependent upon such forest products, also have great potential, thus contributing to the hill farming economies of the Region.

Logging and other commercial harvesting operations when undertaken with proper safeguards to avoid and if necessary, repair any environmental hazards, may still be relevant in some areas to create off-farm income for local people.

The main conclusions, therefore, are:

- o hill farming economies of the HK-H Region are heavily dependent upon forestry,
- o farming alone cannot provide adequate livelihoods to the hill people, and
- o forestry through appropriate activities and investments can generate diversified income and off-farm employment opportunities for the rural people in the hills.

For forestry and allied practices to make maximum contribution to the hill farming economies, while keeping in view the environmental considerations and distant market problems in the Region, it is important to concentrate through appropriate investments on the following activities:

- o short term rather than long term, e.g. fodder, poles, fuelwood/charcoal products rather than saw timber.
- o Occupation outside busy agricultural periods e.g. winter occupations.
- o Small, portable products rather than large and heavy, e.g. carved products (quality goods) rather than large timber.
- o Bamboo and cane products.
- o Wood turning.
- o High cash products rather than low.
- o Specially edible products - fruits, nuts and berries.
- o Medicinal plants, sweet smelling herbs etc. - especially if they can be dried and packed to be transported.

POLICY IMPLICATIONS

Important policy implications derive from this study for the HK-H Region.

- o There is an urgent need in the countries of the Region to re-orient forestry policies from entirely government revenue-oriented forestry to one which is local peoples' need-oriented forestry. The objectives of forestry development programmes should not,

therefore, be limited to the production and harvesting of commercial sawlog timber and industrial pulp wood, but should first satisfy the basic needs of local farm households. Special emphasis should, therefore, be placed on production of livestock fodder, fuelwood, leaf-litter, poles and small timber for rural construction, farm implements and bamboo rather than on revenue-oriented commercial sawlog timber and pulp wood alone. In addition, plantations of fast growing multiple-use species should be established to meet the above needs.

- o While forestation of denuded areas should, without any doubt, continue to be taken up vigorously, it is essential that the improved management and conservation of existing forest resource be accorded a much higher priority in forest development planning and that they be more effectively managed.
- o The need for local people's participation in such resource management activities should be recognized and encouraged through community/social forestry programmes. For motivation and greater participation of the local population, these programmes should be designed and implemented so as to transfer the control of local forest resources to the local communities themselves. Moreover, community/social forestry programmes should aim at achieving a productive partnership in forestry between the local people and the state rather than creating a new situation of confrontation between the local people and government forestry departments for the control of local forest resources.
- o Agro-forestry, well understood by the hill farmers as a part of traditional farming wisdom, also has a potential of making important contributions to hill farming economies in the Region and as such should be promoted through encouragement and appropriate investments. New innovations in agro-forestry will enhance its contribution to the farming economies of these mountains.
- o Improved management/conservation of forests is also important for its protec-

tive role and vital for the sustenance of the hill farming system and down stream agriculture. The still existing high altitude montane forest belt, above the heavily populated and terraced agricultural zone of the mid-hills region, has a very important role to play by way of providing vegetative cover to regulate water flow and protect the soil and as such should be maintained undisturbed. These forests should be excluded from commercial timber harvesting and other exploitative and destructive forestry operations. It is important, however, to consider during forestry development planning and management, their socio-economic importance to local mountain communities.

- o Research should be oriented towards a clearer understanding of the inter-linkages between the various components of the existing hill farming system that combines crop production, livestock management and tree husbandry, and to develop land use systems capable of reducing environmental deterioration while meeting the basic needs of the local people on a sustainable basis.
- o Development of forest based and allied industries have high potential of contributing to hill farming economies. The objectives of a forestry development programme should also be, therefore, to supply raw materials for forest

product-based industries so as to enhance subsidiary sources of income for the rural population. It is, however, necessary to take adequate steps well in advance so as not to harm the local environment due to these activities.

- o Development projects on forestry financed by multilateral and bilateral agencies should not be limited only to commercial plantation and exploitation of timber but should include other tree crops such as fuelwood, fodder, fruit, fibres, and raw material for cottage industries.
- o The conventional role of foresters has been necessarily limited to the policing function, commercial timber production and control and regulation of timber harvesting. There is more than just this that the forester can do for society. The scope of activities and the role of the forester should be increased to plantation, conservation, and people's need-oriented forestry, while encouraging allied activities by soliciting community participation in planting and managing forests for fodder, fuelwood, fruit, timber and poles on community owned and private lands also.
- o Training of foresters: The scope of forestry training should be broadened by including in its curriculum the study of forestry-farming inter-relationship.