Chapter 6
Conclusions

Critical Issues

The findings of this report suggest that both the TA and NTA areas of Ilam district, Nepal, have undergone a rapid economic transformation. There are similar and distinguishing facets in development of the TA and NTA. The similarities include biophysical conditions. However both areas differ in the levels of transformation. The real transformation processes in the TA started in the mid 1980s and in the NTA in the early 1990s. Economic development in both places has been led by transformation in agriculture, specifically high-value cash crops and livestock. Horticulture seems to have played an insignificant role in the whole transformation process in Ilam. This is in contrast to the transformation experiences of Himachal Pradesh in India, the often cited example of mountain transformation. Land-based options adopted in Ilam are guided by a variation in land types on each farm. Generally farmers own diverse types of land, including flat land, *bari*, and gully land. Different types of land are suitable for different types of crops. The same farmer grows cardamoms, ginger, potatoes, broom grass, and cereals as they suit the qualitative variation in the land.

The basic question or concern is not what technologies or production options brought about such remarkable changes in Ilam. We should not assume that these are technology-oriented transformations. The suitability of technology or options is governed by specific pre-conditions which are not necessarily available in all areas of the Nepalese mountains. Therefore, for the purpose of replication, understanding the process of transformation is important. Technology or production options provide a range of choices. Yet, it is important that the pre-conditions to put these options into practice prevail. It is clear that the types and nature of production options in two areas of Ilam are not different. Indeed, cardamoms, potatoes, broom grass, and dairy farming are the lead options that have propelled the transformation process in both areas of Ilam.

Therefore, understanding the process of increasing options is the most crucial factor to guiding the sustainable development of mountain agriculture. In this situation, people will have another option if the previous one fails to perform well. For instance, when there is a backlash in cardamom production due to disease, people switch to ginger production. When the ginger markets are not guaranteed, people opt for potato production. At one time, rabbit farming became so popular that some farmers even went to the extent of exchanging a buffalo for a pair of Angora rabbits. However, due to the lack of marketing and processing facilities, rabbit farming failed completely. Now they have opted for other production options such as dairy farming.

Creation of Awareness about Sustainable Production Options and Their Practice through Demonstration (Effects?) and Exchange of Visits

Unlike Himachal Pradesh in India, the government support in Ilam in terms of research and extension and also subsidy is minimal. In fact, all the crops that have propelled transformation in Ilam are non-priority crops nationally and receive minimal public expenditure for research. The farmers themselves introduced a variety of cash crops, e.g., cardamom, ginger, broom grass, tea, and potatoes in their villages. This happened in the form of a demonstration effect from bordering areas of India, such as Darjeeling and Sikkim, which are relatively developed areas (Shrestha et.al. 1996). There are many other districts in Nepal that can be reached by road and have some institutional infrastructure, but the transformation process has yet to take place. Farmers' exposure to production options and to other transformed areas can have catalytic effects. This will exert pressure on the government to make production options more widely available. Such awareness can be created among the people through various means such as establishing demonstration plots, exchange of visits by farmers from different areas, and so on.

Development of Transport and Communication Facilities

The experiences in Ilam and Himachal Pradesh strongly indicate that development of infrastructure, such as roads, is a prime factor for the adoption of suitable options, as guided by land types. Transport facilities encourage market production. Compared to the transformed area (TA), there is an insignificant difference in the production environment surrounding farmers in the NTA. But relative difficulty in transportation has hindered the forward linkages, hence keeping the production of non-traditional crops low in the NTA. Farmers can take advantage of production options directed to the market only if transportation is not a bottleneck.

The development of roads and communications is no doubt necessary for the promotion of high-quality options. But the question is, "can poor and developing economies afford such roads wherever needed?" To be realistic, this facility should be developed step by step (Shrestha et. al. 1996). In the beginning it may be necessary to build mule tracks and ordinary bridges, in the second stage earthen roads, then gravel roads, before

establishing roads which require heavy investment. In the case of Ilam, mule tracks are being slowly replaced by better roads.

Integration of the Primary Sector with the Secondary and Tertiary Sectors

If processing facilities had not been available, neither tea nor milk production on small farms would have reached such a massive scale in Ilam. Until five or ten years ago, only a few large and resource rich farmers were interested in tea production and improved dairy farming. Establishment of the semi-government milk powder factory in Biratnagar and provision of three private tea-processing plants have proved to be driving forces behind all-season milk production and small-scale tea gardens in Ilam.

Management of Multiplier Effects within Local Environments

Tea gardening and dairy farming are well developed in Darjeeling, yet the local people have not been able to harness the benefits as they have in Himachal Pradesh. Both areas have adopted the strategy of harnessing the local 'niche' but with different policy interventions. In Himachal Pradesh, local people were encouraged to undertake fruit production. This was facilitated by relaxed land ceilings; access to government-owned marginal land for fruit cultivation; subsidies on nursery establishment, buying fruit saplings, and purchasing inputs; and financial support for establishing processing facilities. There is one restriction in that people from other states within the country cannot purchase land in Himachal. This policy has restricted outsiders from benefiting from harnessing the niche of Himachal, particularly on the agricultural front. The case of Ilam is different. In Ilam, the decentralised pattern of growth has solicited the participation of local farmers and entrepreneurs. There is no restriction in terms of outsiders coming in, but locals dominate the economic activities.

Generation and Promotion of Technologies or Production Options with a High Degree of Complementarity

Broom grass is a multipurpose plant. Its tips are used for making brooms which fetch good cash incomes, the stems are used for firewood, and the leaves are fed to livestock which helps ensure normal milk production throughout the year. Milk production is otherwise very seasonal by nature, due mainly to the lack of fodder in winter. Moreover, broom grass cultivation has led to stall feeding. This practice has indirect effects such as improved soil fertility due to greater availability of manure. It also reduces the pressure on forest land, which ultimately reduces soil erosion. Similarly, cardamom cultivation requires shade, therefore fast-growing trees are normally planted alongside cardamom patches. With mature trees, farmers not only obtain a good income from the cardamoms but also obtain fuelwood for cardamom drying and household needs. Further, tree plantation helps prevent soil erosion and provides fodder to animals. In a similar way, the establishment of orchards in Himachal provides winter grasses for dairy farming, checks soil losses, and provides a cash income flow from the sale of fruit.

Therefore, the agricultural R&D policy should be geared towards generating and promoting technologies and production options that are characterised by a high degree of complemetarity (Shrestha et. al 1996).

Political Commitment

In Himachal Pradesh, Chief Ministers and Ministers have long maintained the slogan, 'Give me an apple, I will give you food grains'. There is always ministerial level representation from the most transformed areas of Himachal Pradesh. Political patronage has remained a strong influence on the subsidy policy, distribution of land to landless farmers for growing fruit, and a relaxed land ceiling on land for fruit cultivation. Official data show no landlessness in Himachal. It is empirically difficult to measure the patronage, but the benefits accrued from political patronage seem to be remarkable.

Ilam has a completely different story. Except in the development of road networks, no policies or programmes seem to have been pursued in Ilam that are any different from those pursued in other hill districts. Innovative farmers with access to technology from across the border in Darjeeling provided all the needed impetus for development initiatives.

Replicability of the Ilam Experience

The success story of Ilam in terms of diversification of farm enterprises for sustainable development holds out an incentive for other mountain regions. The required attempts at replication are few but are crucial in that without these it will be difficult to initiate the transformation process.

The three most important primary factors that have propelled transformation in Ilam are innovative and aware farmers, availability of a range of options with appropriate technological backstopping, and transportation infrastructure linking the local markets to markets outside. Road facilities are fundamental in raising educational levels and the receptiveness of the farmers and essential for providing market access to the products and inputs for production. As discussed earlier, building a road network does not, however, necessarily have to be in the form of a fully fledged all-weather motorable road. Gradual easing of the transport bottleneck is what is required as the economy progresses, with the realisation of benefits through adoption of newer options. Ilam's road history attests to this fact. In Himachal Pradesh, a large proportion of the farm products also travels to market through seasonally operating roads.

Products

The choice of economic activities by farmers is governed by resource endowment, availability and suitability of technology, and ultimately the marketability of the products. Sales' potential is paramount and road networks determine the price spread and the share of the farmer on consumer spending. The choice of commodity to produce

needs to be guided by the extent of transport bottleneck. Distant production pockets cannot afford to produce high volumes of perishable products. High-value, low-volume products need promotion in such pockets. Among the products responsible for transformation in Ilam, cardamom fulfills the criterion best. The resource endowment factor may not be a constraint. Most of the farm holdings are comprised of moist-slopy-gully land suitable for cardamoms. Simultaneous plantation along with cardamoms provides the needed shade effect and necessary fuel for drying the product. Cardamoms are a high-value, low-volume and non-perishable product that is environmentally friendly.

Broom grass can be a miracle item to introduce into the hills and mountains due to its fodder, fuel, and product (broom) values. Its potential to stabilise slope terraces and wasteland is also equally important. In the distant hill tracts, the product value of broom grass may be difficult to realise due to prohibitive transportation costs, but its ability to supply forage to livestock, especially in seasons when other sources dry up, is to be noted. Broom grass does not compete with other productive activities and extended adoption of broom grass can be promoted by improving the knowledge and availability of root stocks among the farmers. Broom grass has the potential to reduce the pressure on forest and pasture resources, supply forage to animals in the lean season, and work as a dependable source of fuel supply to the farmers. Finally, broom grass has the potential to reduce soil loss from steep terraces by obstructing the free flow of rain and irrigation water.

In production pockets accessible by road or those close to markets, dairy farming and high-yielding crops, such as ginger and potatoes, are suitable. Proliferation of these in Ilam is supported by the ease in transportation that has come about by gradual intensification of economic activities. Most of the mountain areas in Nepal lack accessibility and are precluded from adopting these options in spite of their local niche and high productivity.

Processes

Continual exposure to options in the form of demonstration is most important in Ilam. Tea, cardamom, broom grass, and (now) dairy farming were not introduced instantly. With decades of history and experience, farmers gradually extended the options as the markets were explored and found. Seeing the activities in Darjeeling and on neighbouring farms installed confidence and experience among farmers to adopt the options fully. Interventions in terms of familiarisation of farmers to mountain pockets with success stories behind them and demonstration activities can best prepare farmers to embark on new and viable options.

Farmers are keen to adopt products and options to use land resources optimally. In the hills and mountains, the same farmers may own lands with diverse micro-environments. Each environment is suitable for different crops and options. The availability of options matched with a variation in the micro-environment is the key to reaping the full potential

from the available resources. To the extent possible, options that are complementary to each other seem to have full acceptance from farmers as demonstrated by options such as broom grass in Ilam. The role of research and technology, thus, is not only to enlarge the choice of production options, but also to present options that are complementary to each other. What is needed is generation and dissemination of technologies supporting diversity in the area and maintenance of the complementary relationships between options.

Roads and, ultimately, markets are fundamental for the expansion of economic activities on a commercial basis. This is important not only for the movement of people, ideas, and products, but also to evolve forward linkages, especially in the form of products' processing. A strong linkage of primary products with processing facilities is essential to ensure sustained market access. Roads do play an important role in the process, but, as discussed in earlier sections, a gradual development of roads is what is required rather than the creation of fully fledged roads. The aim of transport development should be to facilitate production activities and thus a gradual expansion of activities justifying further development of transport facilities. The immediate, full development of a transport infrastructure would be beyond the capacity of the locals and may not be optimal from the point of view of its contribution to development pursuits.