Sustainable Farming and Livelihoods in the HKH: Micro-Level Evidence

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Many mountain economies and much of their environment are experiencing the serious problems of worsening poverty and degradation of natural resources. Mostly dominated by negative changes, the impact of development activities so far has been very limited. There is, therefore, a great deal of concern about making development more effective, and, consequently, there is a growing interest in learning more about successful experiences and the underlying lessons for replication. Some pockets have shown positive trends and are going through a considerable degree of agricultural transformation in terms of production, consumption, and the general welfare of the people. Some generally replicable components of sustainable development can be identified in such pockets.

Himachal Pradesh in India presents a unique case of agriculture-based hill and mountain development. Various state interventions have helped to make it one of the most highly developed hill states in India within two to three decades. The quality of life of the hill people has also improved substantially. Poverty declined from one person in every three in 1971 to one in every seven in 1991. Two-thirds of the total population is now literate compared to one-third two decades ago. This literacy figure is higher than the national average of one-half. All villages receive electricity and more than 95 per cent of the population have access to drinking water.

Ningnan county in West Sichuan Province in China has set another example of change. It has become one of the most well-developed mountain areas from being one of the poorest counties in the country. Ningnan, a small mountainous county located in the eastern Himalayas, covers 1,674 sq.km. with altitudes ranging from 600 to 4,000 masl. Over the past 15 years, the net per capita income increased eight times, per capita foodgrain availability 1.5 times, and gross output per capita grew from *yuan** 225 to 668. A large proportion of the rural population now has access to better health and social amenities, recreational facilities, and other basic needs. Thus, the quality of life has also improved.

In Pakistan, the mountainous areas covered by the Aga Khan Rural

* There are 8.32 *yuan* to the US dollar.

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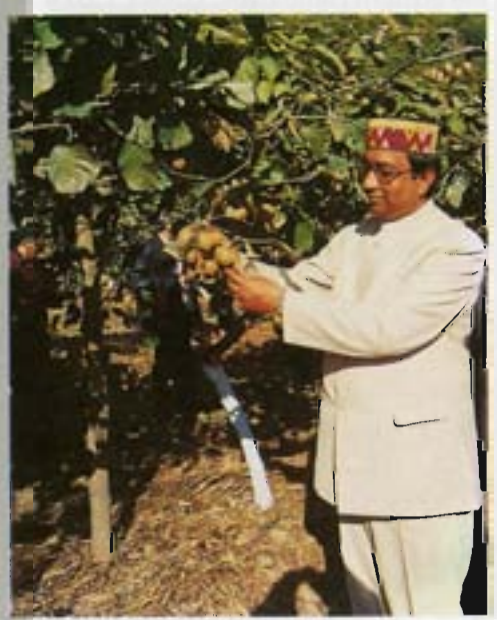
Support Programme (AKRSP) have undergone considerable transformation. The number of households benefitting had risen to 53,000 by mid-1989, or about 54 per cent of the total rural households in the Northern Areas. Savings had increased at least four-fold (US$ 3.0 million) within three years.

In Nepal, selected pockets have also undergone significant changes. For instance, vegetable cultivation has contributed to the tripling of household incomes in the Khani *Khola* area of Dhading district over the last 15 years. Similarly, the per capita foodgrain availability has increased almost four times. The production and consumption patterns in the community have changed. The resource regeneration capacity of the area has also increased, as indicated by increased biomass production at farm level. Farmers are practising stall feeding with no free grazing, thus reducing the pressure on forests. Similar changes in agriculture and the natural resource base have also taken place in some pockets of the Rapti Zone and Ilam districts in Nepal.



Research into diversifying farming. Hon'ble S. P. Thakur, Horticulture Minister (HP), evaluating the performance of a newly introduced kiwi crop at a Research Station of the YSP University of Horticulture and Forestry, Himachal Pradesh, India
T. Partap

Empirical studies were undertaken to gain a better insight and understanding of the forces at work in bringing about positive changes in certain areas. These micro-level studies should help to identify some of the sustainability implications of changing hill farming systems, including their implications for agricultural research and education relevant to mountain areas.

India

Kullu, one of the districts in Himachal Pradesh, was purposely selected for the study. Within Kullu district the Katrain area in Nagar Block was again purposely selected. Plaich in Banjar Block was selected as a stagnant area in the same district.

Farm households (over 75 %) that were small with less than one hectare of land were selected for the detailed study. About four-fifths of the total households had adopted three to four production options in both transformed (TA) and stagnant areas. The production options included crop production, vegetable cultivation, livestock farming, and fruit cultivation in terms of farm activities, whereas non-farm activities included weaving, agricultural labour, non-agricultural labour, selling of wild plant products, services, business, and shopkeeping.

The household and the per capita incomes were higher in all categories of farm households in the TAs than in stagnant areas. This was mainly because households had adopted

high quality options (i.e., those giving better returns) in transformed areas. If fruit cultivation and livestock farming were the major contributors to cash income in TAs, crop production and fruit cultivation were major activities in stagnant areas.

The contributing factors for high quality options were higher literacy rates and improved access to marketing inputs and services. Only 17 per cent of the households were literate in stagnant areas while in transformed areas the rate was about 50 per cent. The distance between the TA and the main market had been 18km in 1975, but was now only two km. Banking facilities had doubled within the same period, whereas in the case of the stagnant areas, these facilities were not available. The distance to market was more than five km.

Compared to the stagnant area, the crop yields of maize, wheat, and rice in the TA were higher by 60, 100, and 120 per cent respectively. The annual household food expenditure in the TA was twice (US$ 1,000) that in the stagnant areas (US$ 500). Furthermore, consumption of food products, such as milk and milk products, meat/fish/eggs, and fruits and vegetables, was much greater in the TA than in the stagnant area.

People were also better clothed and educated; the expenses for these two items were greater by 50 per cent, and 180 per cent respectively in the TA. In the TA houses had electricity, were equipped with TVs ,and about one quarter of them had telephone facilities; these were not available in the stagnant areas. There was also a lower incidence of disease and health problems in the TA due to better quality food, higher education (educated people take more preventive measures), and improved sanitation.

Female literacy was higher in the TA. Similarly, involvement of women in decision-making processes was reported to be increasing. Women had greater access to employment opportunities than ever before.

Nepal

The relationship between the number of options adopted and the level of income in both the TA and stagnant areas of Ilam was about the same. The households had adopted six or more options in both areas. Production options adopted by farmers included cereal crop production, *amliso*, cardamom, ginger, potatoes, fruits and vegetables, and dairy farming in the case of farm enterprises. Non-farm activities mainly included cottage industry activities, services, business, and so on.

Dairy farming remained a dominant activity in both areas as it contributed more than 40 per cent of the total household income. Livestock were followed by tea, cardamom, and *amliso*, and they accounted for another 40 per cent of the household income in both areas. Cereal crop production was minimal in both areas.

The main contributing factors to the adoption of high quality options were the access to marketing and processing facilities in the TA. As the transformed area was located on the periphery of all-weather roads, the TA was linked

to the Darjeeling and Silguri markets in India and the *terai* markets in Nepal.

An average farm household in the former area consumed at least 50 per cent more superior foodgrains (e.g., rice and wheat) and more than 100 per cent more superior fruits, vegetables, ghee, and oil.

The people in the TA were enjoying a better quality of life. The health and sanitation conditions were far superior in the TA. Most households had separate kitchens, lavatories, and guest rooms; these were lacking among the households in stagnant areas.

Unlike in the past, even small landholders had engaged in tea plantation, which had been the domain of large landholders until 10 or 15 years previously. Also, the resource-poor farmers generally possessing low-quality lands had converted them into *amliso* plantations. This option alone had helped them double their incomes. Such farmers could easily earn the equivalent of US$ 300 to US$ 600 per year from selling brooms made from *amliso*.

More than one quarter of the total households had electricity in the TA compared to five per cent in the other areas. Disputes related to land, water, and social evils had somewhat decreased because of the rise in incomes and employment. Women's involvement in managing (independently) different enterprises, such as weaving, rabbit farming, and vegetable cultivation, on a small scale was increasing because of credit facilities.

Synthesis

Sustainability is a dynamic process. Sustainable production options, or their appropriate configuration, today may not be sustainable tomorrow because of certain factors such as changes in demography, people's needs and expectations, markets, integration, and technology innovations. What is, therefore, essential is the promotion of an 'option enhancement' process through which individual households can modify, change, or diversify their production options, according to changing contexts, based on their biophysical and socioeconomic environments.

Unlike in Himachal Pradesh, the role of government interventions in Ilam had been minimal. The farmers had themselves introduced a variety of cash crops (e.g., cardamom, ginger, *amliso*, tea, potatoes, and dairy products) in their villages. This, in fact, was due to the demonstration effect from the bordering areas of India, such as Darjeeling district and the state of Sikkim, which are relatively developed areas. There are many other districts in Nepal that can be accessed by road and which have some institutional infrastructure, but the transformation process has yet to take place. The potentials of the area have not been properly harnessed environmentally, i.e., appropriate high-value crops that are easily marketable have not been promoted.

The experience of Himachal Pradesh strongly indicates that the development of infrastructure, such as roads, is the prime factor for the promotion of high-quality options. Significant differences

in cost for various activities were mainly due to transportation costs. Transportation costs were almost 20-25 per cent higher in stagnant areas.

The development of roads and communications is no doubt necessary for the promotion of high quality options. But the question is, can poor or developing economies afford such roads wherever needed? To be realistic, infrastructural facilities should be developed step by step, beginning with improved trails, mule tracks, earthen roads, gravel roads, and, lastly, good roads that require heavy investment. In the case of Ilam, mule tracks are being slowly replaced by better roads.

It may also be noted that programmes should promote low-weight and high-value products such as vegetable seeds, peas, etc. Apple production in Jumla (Nepal) has been greatly hindered because of the inaccessibility problem.

Had processing facilities not been available, neither tea nor milk production by small farmers would have been feasible. Until five or ten years ago, only large farmers were interested in tea production and improved dairy products. The establishment of one semi-government milk powder factory and three private tea processing plants in Biratnagar has become a major driving force for all-season milk production systems and for opening up small- scale tea gardens.

Both areas have adopted the strategy of harnessing the local 'niche', but with different types of interventions. In Himachal Pradesh, local people were encouraged to go in for fruit production and, for this, the land ceiling was relaxed; access to government-owned marginal land for fruit cultivation was provided; subsidies were given for nursery establishment; and purchasing and public sector procurement and processing was established. In the case of Ilam also some of these aspects were evident. Credit was provided by public sector banks, while

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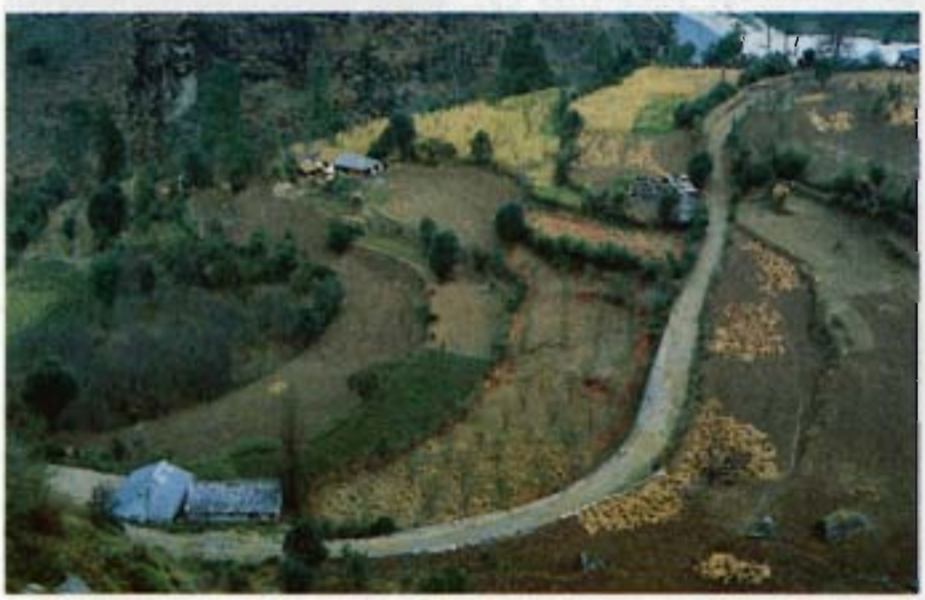

Improving access facilitates the transformation of subsistence mountain agriculture in the HKH
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the private sector (both domestic and external) procured the final outputs.

In conclusion, the common factors that emerge from the Kullu and Ilam studies can be summarised as follows.

First, transformation needs high-value crops or activities that have the potential to generate higher incomes from the existing resource endowments of the farmers. Obviously, some areas have better comparative advantages than others. Organisational capabilities and the technical knowledge to promote these activities or crops are essential.

Second, strong forward linkages with processing sectors are necessary.

Third, in order to facilitate mobility and marketing, transport must be reliable and cheap. Improved access is an important precondition for changing subsistence agriculture.

Finally, there should be some degree of political patronage so that government agencies provide high priority to the development of hill and mountain areas. This will be reflected in service delivery and service expansion, which are extremely critical in the early stages of development.

Discussion

The discussion that followed raised questions regarding the sample size of the studies, the nature of some of the results, and the lack of information on some critical issues such as investments and sources of capital for investments. There were also further elaborations on the role of agricultural universities in the process of change - particularly in supplying improved technologies for off-season vegetables and other horticultural crops. It was generally agreed that both government departments and universities must work together in this respect. Commenting on the factors responsible for bring about change, it was mentioned that changing people's minds through education, training, exposure, and demonstration was an important first step. Regarding replication of successful cases in other areas, some of the critical factors were becoming evident, and development programmes should emphasise these critical aspects. It was also noted that, with increasing incomes, farmers also tend to invest more in better management of their natural resources - particularly soil and water.