

Poverty Reduction and Agriculture in the Hindu Kush-Himalayan Region: Some Emerging Issues

Tang Ya

International Centre for Integrated Mountain Development, Kathmandu, Nepal

Introduction

Reducing poverty has become the single greatest challenge worldwide. In the Hindu Kush-Himalayan (HKH) region, where more than 50% of the population of 150 million people live in extreme poverty, this challenge is even greater than elsewhere. Compared to other mountain regions, the HKH has special development constraints. Among these are the geologically young and unstable topography, fragile and deteriorating environments, small and ever decreasing landholdings, and large and fast-growing population. Despite various measures taken and efforts made by international and national agencies, poverty in this region continues to worsen.

Agriculture is the most important livelihood sector in the HKH region and provides a substantial proportion of rural incomes and employment opportunities. Around 80% of the population are engaged in various land-based activities. Rapid agricultural development, along with improvement of the environment and conservation, is a prerequisite to alleviating rural poverty, and development of agriculture will to a large extent determine alleviation or aggravation of poverty in the HKH region. Unfortunately, agriculture in the region has shown an increasing unsustainability. Hence it will be important to revisit previous agricultural strategies and to improve our understanding of mountain agricultural development.

Experiences and Lessons from Previous Projects

Many projects aiming at poverty alleviation and environmental conservation have been implemented in the HKH region, but the achievements and impacts of many have been insignificant or significant only very locally. A critical review and analysis of some of the projects allows us to draw several lessons.

Technologies should combine improvement in cash income with environmental conservation

Poverty in the HKH region has been closely associated with environmental degradation. However, many poverty alleviation programmes focused on environmental conservation have failed. Environmental conservation is important, but the main players in the mountains are the local people. Therefore, no matter how good a technology is in terms of environmental conservation, if it is not acceptable to and adopted by local people, it cannot do anything for environmental conservation. For farmers to adopt any improved technology, potential improvement in cash income is a prerequisite. The issue of adopting improved technologies is often complicated by the researchers or promoters themselves, who may have involved many factors without carefully examining their significance.

From the farmers' point of view, the major concern is what positive changes occur after adopting a technology. For them, cash income is their first priority, and sufficient cash

income gives them a feeling of livelihood security. This explains why, in some parts of the HKH region, farmers are practising highly intensive off-season vegetable farming that requires many external and labour inputs. They do this because it offers good cash income. Other evidence indicates that farmers are increasingly adopting practices that give fast economic returns, but that may lead to environmental and resource degradation. Practices with potential long-term but no immediate benefits are often not accepted, on-farm research and on-farm demonstration of sloping agricultural land technology (SALT) have indicated that SALT is effective in helping reduce soil erosion, improving soil fertility, and enhancing crop yields. Nonetheless, farmers are reluctant to adopt it, mainly due to the lack of visible and direct increases to cash income. Where cash crops planted in hedgerows (e.g., mulberry in China) or in alleys (e.g., sweet oranges and vegetables in China) have been included in SALT, there has been large-scale adoption of SALT practices.

Poverty reduction programmes should incorporate local biophysical and socioeconomic conditions in the project design and implementation

An analysis of successful poverty reduction programmes in the HKH region reveals that most successes occur in the course of transforming natural resource management in the context of local biophysical and socioeconomic conditions and markets. Further analysis indicates that, unless heavily subsidised by donors or government, success occurs only in places where the local biophysical and socioeconomic conditions have been correctly and sufficiently incorporated in the project design and implementation, with active participation of local government agencies and local people. In this way, the local niches can be best harnessed. Poverty continues in the areas where the local niches have not been well considered, used, or correctly analysed. Local organisations and local people may lack appropriate ideas or approaches about how to identify and harness potential local niches, however, and then interventions from outside are necessary.

Mountains in the HKH region are characterised by greatly diverse physical conditions, which provide a great number of unique habitats or niches and great opportunities for promoting specific niche-based farming systems. However, most of the past programmes have copied imported ideas, with little consideration of adopting options to best exploit and use local niches that can help gain maximum economic and environmental benefits.

Programmes should be attractive to both local people and the local government

Poverty reduction and environmental conservation have been major concerns of many national institutions and government agencies. But the interests of local people and of local governments do not always coincide. The proposed programmes or promoted technologies should address the interests of both local people and local governments. Experience shows that when a programme or a technology is in the interests of both local people and local governments, it is more likely to succeed or to be adopted. In the past, most programmes have been related only to improvement of the environment. Although many improved environmental technologies and practices have been developed and promoted, adoption of these technologies has not been always satisfactory because they primarily met the interests of governments rather than farmers.

Revisiting Mountain Agriculture: Some Emerging Issues

Though it is known that mountains have their unique characteristics different from those of plains areas, the strategies and policies for agricultural development in mountain areas have not differed much from those set for lowland and plains areas. Sustainable agricultural development in mountains requires different strategies from those set for plains areas.

Cereal crops vs cash crops and trees of economic significance

Lack of cash income is one of the major causes of poverty in mountain areas. Increases in household cash income cannot be achieved through development of normal staple food crops, mostly cereals, due to the small production bases and low prices for such crops. Until now most crop production in the HKH has been subsistence-based. However, increases in cash income can be achieved through promoting practices based on agroforestry centred on cash plants and fruit and nut trees. Mountains include unique niches not found in lowlands or plains areas, and certain cash plants are suitable only for such niches. Mountain areas will never be able to compete with the lowlands and plains in producing common crops. The most efficient ways to increase income will therefore be based on making use of conditions that are not present in lowlands and plains. This has become even more realistic with the fast development of globalisation and its associated market linkages. However, a quick review indicates that increasing food production generally has been the focus of agricultural development. As a result, the agricultural structure has been quite simple and income generation has fluctuated.

The biophysical background in mountains is diverse and complex. The diverse, unique, and complicated biophysical conditions should be fully utilised in selecting the most appropriate crop (cash or food) varieties to be promoted so as to develop a really niche-based mountain agriculture. Cash crop farming may be one option. Evidence from the HKH region indicates that cultivation of cash plants can provide a stable increase in income to local farmers. Such success stories can be found, for example, in Himachal Pradesh in India (apples), Ningnan County (mulberry, sugarcane, tobacco) and Wenshan Prefecture in China (pseudo ginseng), and Ilam in Nepal (broom grass).

The quality of croplands in mountain areas is usually low, and agricultural infrastructure (such as irrigation) is underdeveloped. Continuous cultivation has further degraded many mountain croplands in terms of fertility, productivity, water holding capacity, and so on. Some cash plants grow best in such habitats, and are poorly productive on fertile land; huajiao (*Zanthoxylum bungeanum*) is a good example. Promoting low-risk perennial production in poor and marginal lands may be a promising option for generating income.

Full and correct understanding of a region

Correct analysis and understanding of the local physical background are prerequisites for economic development and environmental conservation. This is particularly important for cultivation of cash plants and crop trees. Research reveals that though a particular species can grow in many localities, it will perform best only in some specific ones. Grown in different localities, the useful chemical compounds of certain plants may differ considerably, which affects their value as food or medicines. For instance, one yam species has a wide natural

distribution and has been cultivated for saponin production, but research indicates that only plants distributed or cultivated in specific areas yield effective compounds.

The effect of the temperature of spring water in Jiangkou County of Guizhou Province in China is another example. The water is colder than normal and the temperature varies by only 0.4°C throughout the year, despite large atmospheric temperature variations between summer and winter. This low temperature has affected paddy rice production; the water must be heated by sunshine before flooding the paddy fields. This water has been seen as less useful, until recently when it was found that the water is perfect for raising some high demand species of fish that sell for about 120-150 yuan per kg. The previously less useful resource has become an important source of income generation.

These examples illustrate the importance of a full, adequate, and correct understanding of the biophysical background of a region. There might be many niches or resources whose potential uses remain unrecognised. Since practical information is often scarce, a series of case studies needs to be carried out in selected sites to explore new uses of existing resources or niches.

Disadvantages vs advantages: potential to increase productivity

In developed countries and in many so-called 'rice bowl' regions of Asia, very high levels of output per hectare or per animal unit have already been achieved, and there is little room left for increase. Use of agrochemicals, including chemical fertilisers and pesticides, has reached a very high level in these countries and regions, and the continued and extensive application of agrochemicals has led to a reduction in the incremental yield increases from application of chemical fertilisers (Ruttan 1999) and pesticides.

In contrast, and in part due to physical constraints such as poor accessibility, fragility, and marginality, agriculture has remained largely traditional in many parts of the HKH region, and productivity has been quite low. The use of agrochemicals has been very low, and increasing such usage should be an important area for development. Continuous and extensive application of agrochemicals can cause serious soil and water pollution, however, which in turn have raised concern about food safety. Another option for mountain areas would be to focus on very low-level or no use of agrochemicals and thus produce 'safe' and 'organic' food for which there is a growing market.

Agricultural development vs environmental conservation

Agriculture remains the principal livelihood of poor people and accounts for most land use in developing countries; as such it is probably the single most powerful influence on environmental quality. There may be a potentially serious conflict between environmental quality and poverty reduction in agricultural areas. Examples from many developing countries indicate that in the past many poverty reduction projects have been implemented at an environmental cost; small rural enterprises based on locally available resources have been the main contributors to water and soil pollution.

While some mountain people are aware of the importance of environmental conservation, most marginal subsistence farmers are not much concerned about changes in the

environment, including their causes and results. As a result, agricultural activities have been expanded to very fragile areas, leading to accelerating degradation of fragile environments and the consequent increasing impoverishment of mountain people. Human interventions have been recognised as important contributing factors in the deterioration of natural resources in the mountains, which again have made it even more difficult to eradicate poverty in the mountain areas.

Our understanding of poverty-agriculture-environment interactions and their importance to sustainable economic development has advanced considerably in recent years. However, our capacity to respond effectively is still limited, in part by the limited power of agricultural interventions to address poverty and environmental issues that reflect much broader socioeconomic and policy realities. Evidence shows that mountain people become concerned with the quality of life and environmental conservation only if they have extra income; only then will they participate or invest in environmental conservation. Thus, increasing income should be the priority of poverty reduction and environmental conservation programmes in the HKH region.

The time may have already come to compensate mountain people for conserving or managing valuable resources and for providing services to others.

Migration and seasonal labour vs mountain agricultural development

The trend of transition to a largely urban society in the 21st century is clear. However, it seems that the contribution of migrated farmers or seasonal labourers from mountain areas to economic development in urban areas has not been fairly recognised. Rural areas have been faced with problems of under-development and poverty, decreasing per capita landholdings, and increasing land pressure for many years, but few efforts to solve these problems have used migration as one of the possible options. Many organisations have tried to minimise this trend rather than to manage it in an organised way. Migration is seen as a negative occurrence, with a negative impact. The migration of more people to urban areas may be an unavoidable trend, however. As such we may need to consider it from a positive view. Experiences from many developing countries have demonstrated that seasonal labourers and migrated farmers have contributed to several areas.

- Reduced land pressure: field survey in the Wuling Mountain area of China indicates that as many as 70% of young people leave their family seasonally to look for work in urban areas.
- Economic development in the urban areas: without the contribution of migrated or seasonal labourers, the eastern and the coastal areas of China would not have developed as rapidly.
- Capacity building of the migrated farmers: working with enterprises is also a training process.
- Cash flow to rural areas
- Transferring new technologies and new ideas to rural areas
- Speeding up economic development and urbanisation

Although there have been few reports of efforts to organise seasonal labourers, in some hill and mountainous counties of western China, a government organisation has been

established to help farmers to find jobs in coastal regions and to protect them. This is an area that should be considered more carefully.

Cropland dynamics

The HKH region is quite large compared to other mountain systems in the world, but a very large portion of the region is uninhabitable. As a result, the population density in the habitable part is high. An analysis of cropland loss reveals that urbanisation and natural hazards like soil erosion and landslides have been the most important causes of cropland loss. Furthermore, most of the croplands permanently lost were of high quality. Although there have been some increases in croplands through land reclamation, these lands are often of lower quality than the land lost. As a result, there has been both a net loss of croplands and an overall decrease in the potential productivity of croplands with an increase in marginal lands. The crops grown on marginal lands will have to provide the bulk of the requirements of the future population for food and cash crops. Most marginal lands are not good for food crops but are suitable for cash plants and crop trees. Development of perennial, economic, tree-based agroforestry is one possibility. Research has found that planting trees on flat fertile farmland has an adverse effect on crop growth and yield, but planting trees on marginal farmland can improve crop growth and yield. Even when tree planting leads to reduced crop yield, the overall economic benefits are likely to be higher than those for crops alone.

Decreases in per capita landholdings mean that farmers will have to invest more labour in cropland to support themselves. Improved technologies or practices that require intensive labour and more manipulative husbandry will be better suited to smallholder agriculture.

Organising mountain farmers

Farmers are often forced to sell their products at low prices due to lack of market information and mechanisms. In the HKH region, almost all farmers operate individually. Once cash crops and fruit trees are cultivated, organising farmers will be crucial to securing real increases in income. Farmers operating individually usually compete with each other to sell their products, which benefits the middlemen. In many developed countries farmers have benefited from being organised through the reduced the risk of lower prices.

Farmers' institutionalisation and capacity building

Poverty is a common phenomenon in mountains, but almost every community includes the richer of the poor. Though various factors contribute to these differences, often the different management of similar resources is the most important factor. It will be useful to study the cause of such differences, how these different management practices have helped harness various mountain niches, and the replicability of these practices.

Education has also played an important role in agricultural development in mountains. Compared to illiterate farmers, educated farmers accept new technologies more quickly and easily, manage resources better, demand innovation, and earn much more (Bao et al., this volume). In communities, the richer of the poor are usually those with more education.

Networking

Exchange of experiences and lessons is important for poverty reduction. Networking has therefore been listed as an important component of many projects. It is important to identify and document practices that have provided satisfactory cash incomes to local people. Studies of how these practices have helped harness various mountain niches and possible areas for replicating these practices should be emphasised. A synthesis of different successful practices and natural resource management approaches will help promote the best ways of using marginal farms to increase farm income.

Due to poor accessibility, isolation, and lack of access to information and technology, people in a specific mountain locality usually have limited information about practices in other areas. As a result they cannot learn from success stories in other areas, and mistakes are also repeated. To fill this gap, exchange visits to other regions should be organised. Up to now, most exchange visits have been organised to successful regions and there have been no exchange visits to failed areas. But visiting such areas is equally important, because such visits will help avoid repetition of mistakes. In addition, with the fast improvement in communication in many mountain areas, establishment of an internet-based network will be possible in the future, and the internet may become a significant force in helping people in remote areas to access more information about their products.

Future Directions

A number of factors contribute to increasing poverty in the HKH region, including national and international policies, lack of access to sources of income, lack of appropriate interventions and technologies, lack of empowerment, lack of basic services, and so on. Farmers' access to new income generating options and marketing information, availability of sustainable production technologies and their suitability for the poor, farmers' awareness and assessment of the importance of environmental conservation, and their capacity to mobilise investment resources through their own assets and networks are often very limited or even absent in many parts of the HKH region. These have made poverty reduction in the HKH difficult, and all development and other efforts must take them into consideration.

Poverty is increasingly seen as both a major cause and a result of degraded soils, vegetation, water, and natural habitats. Observers have conceptualised the link between rural poverty and the environment as a downward spiral associated with population growth and inadequate resources for resource management, or as the result of economic marginalisation of the poor leading to their migration to ever more environmentally fragile lands. Reducing poverty should not come at the expense of the environment. Therefore, the major concern of many international and national institutions and agencies is now whether it is possible to reduce poverty while protecting or improving environments.

Cultivation of cash plants has proven to be a useful way of increasing rural incomes. But in many parts of the HKH region, people look outside to learn about potential cash crops, while ignoring potential cash crops that are native to the region. There are many cash plants in the mountains, mostly known only locally. There are also many crops that are neglected or underexploited. Many of these plants may have great potential in achieving

food security and improving livelihoods in the mountains, but are either under limited cultivation or completely wild. For example, cultivated raspberries have been an important cash crop in the USA and Europe, but not in the HKH region, even though there are many wild species of raspberry, some with very good economic traits. There has been some limited cultivation of raspberries on a trial basis, but nothing has been done to identify, assess, collect, or survey the resources in the region.

The demands for natural products in international markets have been increasing rapidly. Many international companies have entered the HKH region to buy raw materials because the HKH region is famous for being rich in medicinal plants, some of which are only found there. Apart from international markets, the member countries of ICIMOD include two big markets for medicinal plants. Cultivation of medicinal plants is thus another way of increasing income from marginal lands.

On the other hand, some constraints in mountains, such as low soil fertility, lack of irrigation, lack of marketing facilities, and so on, have limited agriculture largely to cultivation of food crops although other physical conditions may favour cash crop cultivation. Cultivation of food crops may not always be a viable option in mountain areas.

In the past three decades, the increase in total crop production has been an unarguable fact. But farmers' incomes have not increased concomitantly. The incomes of farmers are actually declining because the cost of inputs is increasing. Agricultural returns are likely to decline further, if not as a result of reduced production then certainly as a result of increased costs. In China, for example, grain production increased threefold from 1965 to 1983, but this increase was achieved through increased use of chemical fertilisers, pesticides, diesel fuel, and electricity for agricultural use by factors of 37, 2, 6, and 11 times, respectively (Weng 1987).

References

- Bao Weikai; Tang Ya; Chen Jianzhong. *Role of Economic Trees in Mountain Farm Economy: A Case Study of Apple Cultivation in Maoxian County, Sichuan Province, China*. This volume
- Ruttan, V.W. (1999) 'The Transition to Agricultural Sustainability'. In *Proceedings of the National Academy of Sciences (USA)*, 96: 5960-5967
- Weng Dazhong (1987) 'Industrial Energy Intensification and Improvement of Chinese Agroecosystems'. In *Journal of Ecology*, 6(3): 1-5