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Globalisation and mountain farmers: Tapping opportunities and mitigating threats

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PREFACE

The compulsion of the countries of Hindu-Kush Himalaya (HKH) region to integrate into the global economy has led them to embrace globalisation and liberalisation as the twin *mantras* for their economic development. Establishment of the World Trade Organisation (WTO) in 1995 seems to have further hastened the process of their integration into the global economy. India, Pakistan and Myanmar (erstwhile Burma) were among the founding members of the General Agreement on Tariffs and Trade (GATT), the precursor to the WTO. Together with Bangladesh, which joined the GATT in 1972, these countries became the founding members of the WTO. Another country in the HKH region, namely, China acceded to the WTO in 2001. Bhutan and Nepal, two other countries of the region, are in the observer status and are negotiating their accession, while Afghanistan is yet to apply for its membership.

While the WTO offers predictability of market access to these countries and free them from the possibility of unilateral trade sanctions being applied by the rich and powerful countries, it does offer certain challenges to them. Among the challenges unleashed by the WTO Agreements, the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) is the most perilous. The patent regime of the TRIPS Agreement is the murkiest area as far as the ensuing threat to rich biodiversity and indigenous knowledge of the HKH region is concerned. TRIPS Agreement does not only require the member countries to provide patent protection on life forms but also mandates them to provide protection to plant varieties.

In order to protect plant varieties, the TRIPS Agreement has provided three options: i) protection through patent; ii) protection through an effective *sui generis* (of its own kind) system; or iii) protection through a combination of patent and *sui generis*. Most countries in the world presently do not have a mechanism in place to protect plant varieties. However, in order to make their regime TRIPS compliant, all the WTO members are required to enact such legislation. The phrase “effective *sui generis* system” has not been defined anywhere, therefore, it is subject to varied, often conflicting, interpretations.

Recent years have seen a sharp increase in the role of intellectual property rights (IPRs) in agriculture. This has led to a demand that the role of farmers and rural communities as sources of genetic material and indigenous knowledge should also be recognised and compensated. However, TRIPS Agreement does not provide any recognition to the farmers for having conserved the genetic resources. United Nations Convention on Biological Diversity (CBD), which has been ratified by 186 countries, does provide recognition to this right. In order to address the conflict between TRIPS and CBD, Doha Ministerial Declaration has mandated negotiations on TRIPS.

Therefore, tension between the provisions of TRIPS, which were included at the insistence of the multinational firms involved in biotechnology and private commercial breeders of the developed world, and the need to protect farmers’ rights in the largely agrarian developing countries is becoming evident.

The discourse on protection of farmers’ rights the world over has now focused on one key question: *What kind of sui generis system should the*

countries put in place? Clearly, this underscores the imperative of taking a balanced approach between protection of farmers' rights and formal plant breeders and giving rights to traditional communities on their genetic resources. This is precisely what one of the countries of the HKH region (India) has done by enacting Plant Variety Protection and Farmers' Rights Act in 2001.

Should the developing countries decide to choose the International Union for the Protection of New Plant Varieties (UPOV) model, a model developed by the North, of the North and for the North, it would spell disaster for the livelihood of their farming communities. This is because UPOV is heavily tilted in favour of breeders and as it stands today does not ensure rights of farmers to save, exchange, reuse and sell seeds. The burden of adjustment is going to be disproportionately higher for mountain farmers who are already poor, marginalised and vulnerable because of their location specific handicaps.

Realising these challenges, South Asia Watch on Trade, Economics & Environment (SAWTEE) together with International Centre for Integrated Mountain Development (ICIMOD) initiated a three year *Regional Programme on Protecting Farmers' Rights to Livelihood in the HKH* in 2001. This programme is being implemented by SAWTEE with the help of its five partner organisations in Bangladesh, India, Nepal, Pakistan and Sri Lanka – the countries in which SAWTEE and its member institutions have been actively engaged in networking, research, advocacy, information dissemination and capacity building exercise in the context of globalisation and liberalisation.

One of the major activities of the programme was to conduct two research studies each in all the five partner countries. The first set of research was carried out by the partner organisations in 2002. This volume is the synthesis report of all the five research reports. Mr. Shafqat Munir of Journalists for Democracy and Human Rights (JDHR) based in Islamabad – a member institution of SAWTEE and Mr. Kamallesh Adhikari of SAWTEE edited this volume. They were supported in this endeavour by Mr. Uttam Sharma, who is a research associate at SAWTEE. We would like to extend our sincere thanks to them for meticulously editing and proof reading the texts. We would also like to thank our partner organisations in all five countries for having successfully completed the research studies.

Neither this publication nor the programme which we are conducting for the protection of farmers' rights to livelihood would have been possible without the financial support of the Ford Foundation and ActionAid. Therefore, we would like to gratefully acknowledge their support and cooperation.

Finally, we hope this document will provide some food for thought to various stakeholders interested in understanding the imperatives of protecting farmers' rights to livelihood in the mountain regions in general, and HKH in particular.

Kathmandu
18 March 2003

Ratnakar Adhikari
Executive Director

CHAPTER I

INTRODUCTION

1. Mountain regions and their specificities

Nature has created a number of opportunities and ecological balance for mountain communities in a special ecosystem

Mountain environments are essential for the survival of global ecosystems. They provide water, energy, minerals, and forest and agricultural products; are areas of recreation; and store the biological diversity necessary for the sustainability of human life. Nature has indeed created a number of opportunities and ecological balance for mountain communities in a special ecosystem. Yet, they are the most deprived and marginalised communities in the world.

While, on one hand, mountain regions are susceptible to soil erosion, landslide, and loss of genetic diversity, on the other, lack of proper attention from the governments, unplanned exploitation of mountain resources and uneven distribution of resources within the communities have become the reasons for their physical isolation from the mainstream political, social and economic systems. Expansion in education and health services, the development of roads and electricity, improvements in irrigation and agricultural and related technologies, the penetration of commercial forces and now the wave of information technology are drastically altering many regions of the world, but the mountain regions have a long way to go to catch up with these global developments. In fact, the situation has become even more complex now. The policies of liberalisation, globalisation and the World Trade Organisation (WTO) have further exacerbated the vulnerability of these regions. The mountain regions of South Asia that fall within the territory of the Hindu-Kush Himalaya (HKH) region are no exception.

While, on one hand, farmers are facing the natural handicaps to sustain their livelihoods, on the other, due to indifferent state policies, they are often neglected

Growing inequalities and imbalances, food insecurity, indebtedness, inaccessibility to infrastructure services and resource degradation (land, water and forests) in mountain regions across South Asia have put the livelihoods of mountain people at stake. These regions and the communities living there therefore need proper care and attention. Farming community is one of them. In majority of the South Asian economies, agriculture plays a vital role. However, neither the potential of agriculture has been fully realised nor the farming communities are provided with the incentives they deserve. The case of the mountain farmers in the region is even more pathetic. While, on one hand, they are facing the natural handicaps to sustain their livelihoods, on the other, due to indifferent state policies, they are often neglected.

In the global race of liberalisation and globalisation, they have always been behind. Moreover, various Agreements within the WTO regime such as the Agreement on Agriculture (AoA), the Trade Related Aspects of Intellectual Property Rights (TRIPS) Agreement and the Agreement on Sanitary and Phytosanitary (SPS) Measures have now come up as major challenges, especially for the farmers. For example, in the name of patenting through the TRIPS Agreement, the authorisation of monopoly rights to the multinational corporations (MNCs), which accentuates the process of theft of indigenous knowledge and resources by legalising 'biopiracy', would undoubtedly affect livelihood options of the farmers.

The objective of the research in five countries was to study the plight of mountain farmers in light of threats arising from the recent changes in the economic policies and agricultural practices

Taking these important aspects into account, South Asia Watch on Trade, Economics & Environment (SAWTEE) together with International Centre for Integrated Mountain Development (ICIMOD) launched a three-year *Regional Programme on Protecting Farmers' Rights to Livelihood in the HKH Region* in five South Asian countries, namely Bangladesh, India, Pakistan, Nepal and Sri Lanka, in the year 2001. SAWTEE involved its five network institutions in the programme as project implementing partners: Bangladesh Environmental Lawyers Association (BELA) in Bangladesh; Consumer Unity & Trust Society (CUTS) in India; Forum for Protection of Public Interest (Pro Public) in Nepal; Sustainable Development Policy Institute (SDPI) in Pakistan; and Law & Society Trust (LST) in Sri Lanka.

Under the same programme, the partner organisations of SAWTEE conducted research on specific subjects in their respective countries. The objectives were to study the plight of mountain farmers in light of threats arising from the recent changes in the economic policies and agricultural practices and recommend the suitable strategies to the concerned authorities within the region so that farmers' right to livelihood could be protected.

This volume is the compilation of the synthesis reports of the same studies that were undertaken by SAWTEE's partners. In the volume, country chapters have analysed the impacts of liberalisation, globalisation and the WTO Agreements on the livelihoods of mountain farmers. The research studies have converged on a point that trade liberalisation should not erode, but ensure sustainable livelihood options, especially to the mountain farmers as they cannot bear the brunt of rapid trade liberalisation.

2. Background of research areas and topics

In Bangladesh, there has been a limited stretch of hilly areas spread over its northern and south-eastern regions. The important hilly area, known as Chittagong Hill Tracts (CHT), has a total area of 13,295 sq. km. and covers about 52 percent of the forestlands of the country. When the country was divided into 19 districts, the CHT used to be the biggest district of Bangladesh. The area is different in surface and soil conditions in some respects from other regions of HKH.

Khagrachari was chosen as a research area for two main reasons

The CHT has three districts, namely Rangamati, Khagrachari, and Bandarban. BELA selected Khagrachari as a research area for two main reasons. First, influence of insurgency was less there and second, the district is said to be very diverse in terms of resources and use patterns of those resources. BELA conducted the study on "Traditional Knowledge and State of Biodiversity in Chittagong Hill Tracts (CHT): A case of Khagrachari". It chose three villages of Khagrachari - Headman Para, Kumardhan Para and Kuki Chara, covering altogether 318 households.

In India, the mountain agro-economic regions which stretch in the north-western part of the country over the states of Jammu and Kashmir, Himachal Pradesh, and the Kumaon and Garhwal areas of Uttaranchal (formerly part of Uttar Pradesh) as well as in North-East covering seven states (popularly known as the 'Seven Sisters' of North-East India), i.e. Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura, present a very important case so far as the possible impacts of liberalisation, globalisation and the WTO Agreements are concerned.

CUTS sampled six districts from two states of north-eastern region covering 77 villages and a total of 245 households and two districts from the Garhwal region covering 30 villages and a total of 90 households

CUTS, realising that there is a need to conduct an enquiry into the livelihood of the farming community, the crop composition in mountain agriculture and the possible scope of crop diversification and alternative livelihood strategies for a proper understanding of the impacts of liberalisation, globalisation and the WTO Agreements, conducted its research in the districts of North-East and Uttaranchal. CUTS sampled six districts from two states of north-eastern region covering 77 villages and a total of 245 households and two districts from the Garhwal region covering 30 villages and a total of 90 households.

In Nepal, there are three distinct ecological belts, namely Himalaya, Hills and Terai. The ethnographic distribution of people in these three eco-regions is quite different. Farming systems in practice are based on resource endowment and management/utilisation system of the people. Agriculture is still traditional and animal husbandry is one of the important means of livelihood for majority of the population in the hills. The study was carried out in three Village Development Committees (VDCs) of Panchthar, Kavre and Lamjung districts, representing eastern, central and western regions.

Pro Public collected the data by interviewing 230 respondents, using random sampling method. Rais/Limbus, Tamangs and Gurungs dominated the respondents, hailing from 12 different ethnic groups. Majority of them were literate. Farming was the only means of livelihood for almost all of them.

The farmers divert water from glacial rivers to their fields through a complex system of irrigation channels to grow arable crops and fodder in Pakistan

In Pakistan, around one million people live in the northern areas. Most of them are engaged in subsistence agriculture. The region is a semi-arid, situated in the Himalayan rain-shadow where cultivable land is a scarce resource. The farmers divert water from glacial rivers to their fields through a complex system of irrigation channels to grow arable crops and fodder. To avoid crop damage, livestock are sent to high altitude, alpine-style pastures in summer.

The farming system in Pakistan's northern areas is highly integrated in nature with a high degree of inter-dependence between arable cropping, forestry, and fruit growing and livestock production. Furthermore, there is a close inter-relationship between livestock production within the village precincts and on high pastures. SDPI selected the districts of Gilgit and Skardu of the northern areas, part of the HKH region, to undertake the study. The study area comprised the following villages: Sultanabad, Shimshal valley, Roshanabad, Nulter, Galiane, Jaglot in Gilgit district; Karimabad, Gulmit, Gulmat in Hunza district; Astore, Thore, Zian, Chongra in Diamer district; and Arund, Mehndi in Skardu district.

Though Sri Lanka does not have a high concentration of farmers in the mountains, as compared to the other mountain regions in HKH, the evolution of Sri Lankan farmers in the face of increased concern for fragile ecosystems merits due attention. The objective of the study conducted by LST was to find out how the traditional role of the farmers has evolved into what it is today. The farmers' right to livelihood, within the framework of sustainable development, has been the focus of the study. Ratnapura division was selected for the study for its proximity to the mountain range. The division is important for managing the balance of ecosystem, as any farming activity done here would impact more heavily on the mountain range and its ecosystem than in other areas.

3. Livelihood strategies and farming systems

Farming practices and the related indigenous knowledge are gradually disintegrating due to government's market-oriented agricultural policy

Food grains produced in the mountain regions are not adequate to meet the requirements of the communities living there. They are therefore looking for alternative methods of farming and other means of livelihood for supplementing their family income. Farming is not only an occupation but also a way of life for them. Hence, it is attached to socio-cultural value system. However, farming practices and the related indigenous knowledge are gradually disintegrating due to government's market-oriented agricultural policy and fast eroding socio-cultural value system.

Most of the people of CHT in Bangladesh depend on agriculture for their livelihood due to topography and climatic conditions. Only a small percentage of the population is engaged in business, trade, government services and other professions. They are also engaged in certain types of art and craft works for other day-to-day needs of life. They build their own houses, make their own looms, weave their own dresses, make their baskets, and manufacture their household utensils, agricultural implements and beverages. For centuries, these local people have adopted sustainable development strategies without any external inputs. The communities are particularly rich in indigenous knowledge related to fermented foods and preparation of beverages.

Of the heads interviewed, 53.1 percent are farmers, 12.6 percent are *jhum* cultivators, 14.5 percent are day labourers and 9.7 percent are service holders. The rest have the professions of business, wood collection, manual transport owner, shopkeeper and so on. Besides having a primary occupation, the households have also other occupation, which could be termed secondary occupation such as cow rearing.

Occupational composition shows that cultivation and NTFPs collection remain overwhelmingly dominant occupations of the mountain communities in North-East and Garhwal

In India, occupational composition shows that cultivation and NTFPs collection remain overwhelmingly dominant occupations of the mountain communities in North-East and Garhwal. More than 95 percent of the sample households in each of the villages of two regions vindicate this observation. The extreme dependence on NTFPs apparently indicates the level of poverty of the local population. Their livestock depend largely on NTFPs for survival, and so do the people themselves. For example, because of high demand, a peculiar type of 'crop', namely broomstick (grass), is grown and cultivated in the forests of Meghalaya. Among the well-known cash crops, Betel nut is grown widely in large parts of the Goalpara district of Assam and to a lesser extent in the Garo hills, particularly in the east. Rubber is another cash crop that has recently become popular particularly in some parts of Assam and Meghalaya. In the latter, sericulture is also practised. Flowers and orchids of wide and exclusive varieties and fruits of high quality that grow abundantly in large parts of Assam and Meghalaya can also be developed as major cash crops of the region.

Making handicraft items is a leisure-time occupation for them. A wide variety of handicraft items like bamboo baskets, bamboo mats, cane baskets, cane tools, bags and clothing from the locally available yarns are made. Among the NTFPs and medicinal herbs produced in forests, *Neem*, *Tulsi*, and various types of bitter herbs are popularly used in North-East, and herbs such as *Atees*, *Kaudai*, *Hathpanja* and *Salam panja*, *Meetha*, *Kutki*, *Bukhar ki jadi*, *Kasmir ki jadi* are widely used in the villages of Uttarkashi and Tehri-Garhwal. Almost everybody uses some medicinal

herbs as preventives or curatives for various ailments and maladies.

In Nepal, crops, livestock and forests are three major components of the farming system

In Nepal, crops, livestock and forests are three major components of the farming system. Cereal crops grown by the hill farmers in priority order are: maize, rice, millet, wheat, buckwheat and barley. Besides these cereals, many farmers grow potatoes, seasonal vegetables, spices, and fruits. A few households also grow mustard and various legumes, primarily for domestic consumption. However, in Kavre, the district of the central region that was selected for the study, some farmers are growing potatoes and vegetables such as tomato, bitter gourd, cabbage and cauliflower for commercial purposes.

In the past, maize cultivation played a vital role in the hill farming system, as it was the major staple food for the majority of the people. However, over the last few decades, food habits of the mountain people have been gradually changing and they have started preferring rice to maize. Consequently, maize has become the main stuff for animal feed. Those living in the areas where market is accessible, are replacing their traditional (cereal) crops with cash crops like seasonal vegetables and fruits.

Most of the farmers also keep different types of livestock for various purposes. Buffaloes are raised mainly for milk and manures; cattle for draught and manures; and sheep, goats and poultry for meat and supplementing cash incomes. Farmers rear animals according to their socio-cultural traditions, needs and suitability in the local environment.

The level of access to resources and livelihood opportunities is different among the various vulnerable groups in the northern areas of Pakistan

The level of access to resources and livelihood opportunities is different among the various vulnerable groups in the northern areas of Pakistan. The resources are unevenly distributed among communities thereby threatening the livelihood opportunities of the marginalised sections, like farmers. Agriculture and livestock both shape the means of sustenance for the people. In summer, the communities living around tourist resorts depend on tourism. Seasonal employment in agricultural sector is also common.

It is unfortunate that some foreign pharmaceutical companies have already patented certain medicinal qualities of *Artemisia*, and *Ephedra*

Trading has become another source of livelihood. Recently, collection of medicinal plants and other herbs from mountains has emerged as a popular trend. These medicinal plants and herbs are sold across the country through intermediaries. The northern areas are rich in biological resources and house a large number of plants of medicinal value. Astore district is known as 'store house of medicinal plants'. Very good quality of Kurth or *Saussurea lappa* is found in this area. However, its trade is prohibited under Convention on International Trade in Endangered Species (CITES). This area also abounds in *Artemisia* spp, *Podiphyllum emodi*, *Ephedra* spp, *Glycyrrhiza glabra*, *Picrorhiza kurrao*, *Aconitum heterophyllum*, *Ferula foetida*, *Onosma* spp, *Rheum emodi*, *Thymus serpyllum*, *Valeriana wallichii*, *Hippophae rhamnoides*, Black cumin, *salajit* and sea buck thorn. These plants are collected without any proper consideration to their conservation and sustainable use. At present, these plants face a number of threats including that of loss of habitat either due to climate change or due to increased human encroachments. It is unfortunate that some foreign pharmaceutical companies have already patented certain medicinal qualities of *Artemisia* (used for stomach problems), and *Ephedra* (used to cure Asthma).

The Sri Lankan mountain communities largely depend on tea cultivation for their livelihoods. The data reflect that most of the farmers are of middle to high level income earning capacity. In this respect, tea farmers differ from that of paddy farmers of other districts, as paddy farmers are low to middle income earners. Farmers in Ratnapura previously used to grow paddy, however, with the decrease in the demand for paddy, they have converted to tea growing instead. Tea has always fetched high prices and has a much more stable market than paddy.

4. Main findings

In the study area of Bangladesh, water is a scarce commodity. More than forty percent of the households in the CHT have to walk on an average a distance between 100 and 500 metres to collect potable water and the responsibility lies with the women. The villagers usually use bamboo, grass, mud and *chan* (a kind of tall grass suitable as a thatching material) as house building materials. On an average, while 43.7 percent of the households use tin as roofing material, others collect bamboo and *chan* grown in nearby forests.

Older generation is concerned about the loss of biodiversity and is able to better narrate the situation

The people share common views on the biodiversity of their area. The older generation is concerned about the loss of biodiversity and is able to better narrate the situation. Their perception is that new varieties of seed do not give better yields and seeds of high yielding varieties cannot be preserved. But they say they have the techniques to preserve the traditional varieties. Fertility of land has been affected because of *jhum* cultivation. Though the application of cow dung keeps the soil fertile for three years, chemical fertilisers are used every year.

During the survey, the people in the area identified 153 medicinal plants available in the CHT. These plants grow in the area but while naming the plants, shrubs and rice varieties, they have included types, which have been imported in the area. Their perception about the presently available plants, fishes and birds was that there has been a general decline in the rich biodiversity of the region.

The findings of the survey conducted by CUTS indicate that the cultivation for agricultural production is the most dominant livelihood strategy. Livestock farming is an additional major livelihood strategy particularly in Garhwal. The main crops are paddy and vegetables in North-East and wheat and potatoes (along with paddy) in Garhwal. *Chhimi dal* and *Rajma* are also significant crops in the latter area.

In some of the mountain areas, especially in the lowland areas or areas near hill towns and tourist spots, chemical fertilisers and pesticides are largely used

The people in the mountain areas are mostly poor especially in the highland areas, and depend substantially on forest products and NTFPs for their survival. Most of the crops are produced first for domestic consumption, and then for the market, except in the case of cash crops. In some of the mountain areas, especially in the lowland areas or areas near hill towns and tourist spots, chemical fertilisers and pesticides are largely used. Though villagers have known their adverse effects like long-term loss of natural nutrients of the soil, they have become increasingly dependent on them.

The mountain areas are rich in medicinal herbs and villagers use them widely for cure and prevention of their ailments without any sound

knowledge about them. These crops may be developed and can become a better livelihood option. In some areas, handicraft products bear the stamp of sound skill and competence. But these are mainly produced for domestic consumption, and are sold, if at all, at throwaway prices, because of an ill-developed market and lack of awareness about the market potential.

Despite considerable annual government investments in agricultural sector, targeted programmes have not reached the majority of farmers

Pro Public's findings show that the agricultural development policy and programmes of the government in Nepal have mainly focused to introduce high yielding technologies by replacing traditional practices of farmers. Limited attention has been given to the implications of new interventions on the local environment, biodiversity and livelihoods of the hill communities. As a result, overall productivity of crops has not increased, food sufficiency at household level has not improved, and dependency of farmers on external inputs has increased.

Despite considerable annual government investments in agricultural sector, targeted programmes have not reached the majority of farmers, even to those in the vicinity of district headquarters in the hills. A limited number of farmers in the accessible areas are gradually adopting high yielding technologies and producing more yields for all major crops by intensively utilising their land. High yield is the single most convincing factor for majority of small and marginal farmers for choosing the high yield variety technologies and the perceived negative impacts are often ignored. Traditional knowledge and practices of farming systems are disappearing very fast. There is a need to preserve and promote such practices.

Pakistan is not in a position to provide any export subsidies for fruits such as cherries, apricots, pears and apples. The perishable nature of fruits requires either immediate export of these fruits, or proper storage facilities. Without government support, local communities cannot accomplish these tasks. Much of the fruits like apples, apricots and cherries as well as vegetables like potatoes and Chinese cabbage perish due to non-availability of storage facilities.

Mostly, the merchants from down country purchase on a seasonal basis the fruit trees and vegetable fields and pay a lump sum amount to the farmers. While the demand of organic apricots from Switzerland was 400 tonnes in 2002, the Aga Khan Rural Support Programme (AKRSP) was able to export merely 60 tonnes. Pakistan is still allowed to provide domestic transport and freight charges under AoA. This option could be explored as export facilitations. There should be a provision of a special package under the WTO Agreements to support the trading activities in the fragile areas such as the northern areas. These areas, being the least developed areas (LDAs), could rightly be taken at par with the least developed countries (LDCs).

Farmers will not be able to increase their productivity if they do not have access to the latest methods and know-how

The key findings of the research in Sri Lanka show that some of the farmers do not own their own lands and they have to farm on state land under the license from the state. Others indulge in a dangerous practice of encroaching mountain areas, thereby threatening fragile ecosystems as well as causing the destruction of valuable species. They would have to face the risk of being put out of the land and have to forego the reward for the farming activities they had already carried out. The farmers, especially the women, and their families are also at high risk of health hazards, which need to be addressed.

***Though incomes are high,
they know neither to save
nor invest, thereby causing
concerns for the future***

Saving is virtually non-existent among the farmers in this area. Though incomes are high, they know neither to save nor invest, thereby causing concerns for the future. Further, productivity is also a concern. Farmers will not be able to increase their productivity if they do not have access to the latest methods and know-how, as they do not have any traditional or indigenous methods to fall back on.

CHAPTER II

TRADITIONAL KNOWLEDGE AND STATE OF BIODIVERSITY IN CHITTAGONG HILL TRACTS (CHT): A CASE STUDY OF KHAGRACHARI

1. Introduction

Basically a flat delta, Bangladesh has a limited stretch of hilly areas spread over its northern and south-eastern regions. The important hilly area, known as Chittagong Hill Tracts (CHT), has a total area of 13,295 sq. km. and covers about 52 percent of the forestlands of the country. The area is situated between 21° 25' and 23°40' North latitude and 91°55' and 92 °45' East longitude. The area is different in some respects in surface and soil conditions from other regions of the Hindu-Kush Himalaya (HKH).

With a circuitry of rivers and streams, fed by heavy monsoon and washed by frequent floods, the whole territory is a crowded green mass of wild growth containing a variety of plants, creepers and trees

The area has four main valleys, which are considered the oldest geological formation in Bangladesh. The valleys are *Changi, Maini, Rainkhiang,* and *Sang*. Some of these valleys are up to 80 km. long and 10 km. wide. The height of the hill ranges varies from a few hundred metres to over 1,000 m. With a circuitry of rivers and streams, fed by heavy monsoon and washed by frequent floods, the whole territory is a crowded green mass of wild growth containing a variety of plants, creepers and trees. The forests of CHT are broadly of three kinds: tropical evergreen; tropical semi-evergreen; and tropical moist deciduous.

The area has a population of 1.06 million and the literacy rate for both sexes stands at 29.9 percent as against the national average of 32.4 percent. The CHT has two types of visible land tenure - freehold and leasehold. The later is the issue of confrontation between the hill people and the settlers brought in from other areas of the country. The settlers, mostly dirt poor and victims of different natural disasters, have been accused of displacing the ethnic nationalities from the land they had owned for ages.

Monsoon induced rainfall averages 250 cm. a year. The summer stretches from March to June, with an average temperature of 30 degrees Celsius and occasionally going up to 40-42 degrees. Winter runs between November and February with an average temperature of 20 degrees Celsius and occasionally falling to 4-5 degrees.

2. Livelihood and living options of the people of CHT

Because of topography and climatic conditions, the people of CHT fall back upon agriculture for their livelihood

For a long time, the area was almost secluded and the people had no contact with the outside world. The situation began to change as the British colonial masters took control of the area in 1760. Because of topography and climatic conditions, the people of CHT fall back upon agriculture for their livelihood. Only a small percentage of population is engaged in business, trade, government services and other professions. Besides agriculture, they engage in certain types of art and craft work that account for other day-to-day needs of life. They build their own houses, make their own looms, weave their own dresses, make their baskets, and manufacture their household utensils, agricultural implements and beverages.

Over hundreds of years, the local people have adopted sustainable development strategies without any external input

When the country was divided into 19 districts, the CHT used to be the biggest district. Now, the CHT has three districts, namely: Rangamati, Khagrachari, and Bandarban. Khagrachari has an area of 2,700 sq. km. with reserve forests spreading over 103 sq. km. and unclassified forests over 1,094 sq. km. The 'thanas' of the district are Khagrachari Sadar, Dighinala, Paanchari, Mahalchari, Matiranga, Manikchari, Ramgarh, and Lakhmichari. It has 34 unions and 127 *moujas*. The tribes of this district include Chakma, Marma, and Tripura. Over hundreds of years, the local people have adopted sustainable development strategies without any external input. The communities are particularly rich in indigenous knowledge related to fermented foods and preparation of beverages.

The valleys are highly suitable for agricultural and horticultural activities. As the rivers of the area flow through steep slopes with powerful currents, they are good sources for generation of hydroelectricity. The construction of the Kaptai Hydroelectric dam in Rangamati in 1960 was the most serious blow to the life and economy of the local population. The dam uprooted as many as 100,000 people and they were not given proper compensation for their rehabilitation. The second threat emerged after independence of Bangladesh when their status as ethnic minority was denied in the Constitution, which gave birth to the armed insurgency in the region. Coupled with an insurgency initiated by the Chakma population, the area witnessed a longer bloodletting violence.

The situation apparently changed with the signing of the Peace Agreement with the leaders of the insurgency on 2 December 1997. The signing of the Peace Agreement was expected to allow government initiatives for development of the area. However, the Peace Agreement has not restored peace in the area. Factional fights have resurfaced and splinter groups of the former insurgents are now engaged in ransom collection, taking people hostage and unsettling any peace process.

3. Threats facing the area

Whether the people of the area like it or not, the World Trade Organisation (WTO) Agreements would have significant impacts on the life and living of the people. The proposed Asian highway linking Bangladesh with Myanmar would run very close to the area and if Bangladesh decides to open trade routes for people of North Eastern states of India, the area would be linked to regional trade. The linking of the area to regional trade would change the social dynamics of the area.

The use of water resources for generating electricity had created one of the worst impacts

The area, being quite close to the Bay of Bengal, would also be subjected to adverse impacts of possible rise in sea level, especially in conserving its rich biodiversity. There has been no proper evaluation of natural resources in the area except that of water resources. The use of water resources for generating electricity had created one of the worst impacts. Some other studies claim there is gas and oil in the area. These are all issues for concern of the local people. But they are for the present concerned about restoration of land ownership and protecting the roots to which they belong.

4. A case study in Khagrachhari

Bangladesh Environmental Lawyers Association (BELA) conducted a study in three villages of the Khagrachari district - Headman Para, Kumardhan Para and Kuki Chara. All together 318 households from all the villages were

covered by the study. The objectives of the study were:

- a. to have an understanding of the livelihood of the ethnic population living in such a mountain environment; and
- b. to have an understanding about people's perception of biodiversity situation of the area.

The villages covered by the study individually represented three ethnic communities. These are: Marma (Headman Para), Tripura (Kumardhan Para); and Chakma (Kuki Chara).

4.1 Key information drawn from the study

Of the heads interviewed, 53.1 percent are farmers, 12.6 percent are *jhum* cultivators, 14.5 percent are day labourers and 9.7 percent are service holders

Of the heads interviewed, 53.1 percent are farmers, 12.6 percent are *jhum* cultivators, 14.5 percent are day labourers and 9.7 percent are service holders. The rest have the professions of business, wood collection, manual transport owner, shopkeeper and so on. Besides having a primary occupation, the households have also other occupation, which could be termed secondary occupation such as cow rearing.

About 81.1 percent or 258 respondents have a monthly income in the range of Taka 1,000-3,000. About 8.5 percent belong to the income group of less than Taka 1,000 a month and 8.2 percent belong to the income group of Taka 3,000-5,000 a month.

Information provided by the respondents show that they do not borrow money to run families or survive. In Headman Para village about 27.2 percent of the households took loan, while this figure is 44.6 percent and 19.4 percent for Kumardhan Para and Kuki Chara respectively. Of the loan collected by all the households, 38 percent is in kind and the rest in cash. These loans are available from relatives, neighbours and members of the community, with interest. The loan in kind includes basically paddy in the range of 40 kg to 800 kg. The micro-credit programme is yet to have a strong coverage in the area, as the number of non-governmental organisations (NGOs) working in the area is limited. Only about 19.6 percent of the households are member of NGOs.

Water is also a scarce commodity in the area. More than forty percent of the households in the area have to walk on an average a distance between 100 and 500 metres to collect drinking water and the responsibility lies with the women members of the households. Sanitation is another problem in the area.

The people of all the villages are dependent on words of mouth for information. Access to radio and television is very limited and completely different from national situation.

The villagers usually use bamboo, grass, mud and *chan* (a kind of tall grass suitable as a thatching material) as house building materials

The information collected also shows a very interesting picture about the exposure of the respondents to the world outside their villages or neighbouring areas. Fifty percent of the respondents have never travelled beyond the periphery of their villages. Only 13.2 percent of the respondents have ever travelled to Dhaka, the capital of their country.

The villagers usually use bamboo, grass, mud and *chan* (a kind of tall grass suitable as a thatching material) as house building materials. On an average 43.7 percent of the households use tin as roofing material. They collect

bamboo and *chan* grown in nearby forests.

4.2 People's perception on biodiversity of their area

Many of the indigenous variety of fishes are gone because of poison (pesticides) sprayed in rice fields

Chinadhan Marma of Headman Para village while explaining the changing farming practices in his village, said: "The rice variety of the olden days is gone. Now we have to buy *bideshi* (foreign) seeds at a higher price." Chinadhan has many more regrets. Snails, considered to improve eyesight, are no more available. Gone are white and red shimul (silk-cotton tree), ingredients of which are essential for maintaining vigour. Even many of the indigenous variety of fishes are gone because of poison (pesticides) sprayed in rice fields.

There are other voices too that speak of poverty and argue in favour of foreign seeds to have better yields. But Tanchaingya Marma of the same village understands the importance of biodiversity. To him, the biggest loss has been in the area of medicinal plants. They were, at one point of time, dependent on different medicinal plants for common diseases like jaundice, rheumatism, diarrhoea, dog bite, headaches, partial paralysis of limbs, eclampsia, malaria, epilepsy and leprosy. They had even effective arrangements for birth control. But they are not ready to share this information with outsiders. The reason for that was "lack of trust."

People of these villages have a common understanding of the biodiversity of their area. The older generation is more concerned about the degradation of biodiversity and can better narrate the situation. Their views can be summarised as follows:

- a. New varieties of seed do not give better yields.
- b. Seeds of high yielding varieties cannot be preserved but they say that have the techniques to preserve the traditional varieties.
- c. Fertility of land has been affected because of *jhum* cultivation.
- d. Application of cow dung keeps the soil fertile for three years, but one has to apply chemical fertilisers every year.
- e. Production of new varieties of rice involves additional cost.
- f. In the past, women used to conserve seeds, which are now brought from the market.

During the survey, the people in the area identified 153 medicinal plants. They identified most of the plants in their own dialect, deciphering of which was a time consuming task. These plants grow in the area but while naming plants, shrubs and rice varieties they have included types, which have been imported into the area.

They identified human aggression as the major reason for the decrease of fruit tree varieties

Their perception about the presently available plants, fishes, birds also point to the general understanding that there has been a general decline in the rich biodiversity of the region. They identified human aggression as the major reason for the decrease of fruit tree varieties. According to them, these trees have decreased over the last ten years or more. So is the case with wood/bamboo/cane.

Discussions with the people point to the following reasons responsible for change in traditional farming practices and a decline in biodiversity.

- a. Poverty
- b. Population pressure

- c. Lack of attention to indigenous agricultural practices
- d. Absence of farmers' organisations and groups
- e. Lack of clear land and resource tenure
- f. Lack of knowledge of the biodiversity in the region
- g. Lack of capacity for biodiversity conservation
- h. Lack of participation of the local community in biodiversity conservation
- i. Conservation not being based on local ethical values
- j. Lack of documentation of indigenous knowledge on natural resource management with special reference to livelihood
- k. Degradation of the watershed
- l. Deforestation

The respondents are not very sure about how to cope with the problem of loss in biodiversity

The respondents are not very sure about how to cope with the problem of loss in biodiversity. Their world is still limited to themselves and they are not ready yet to share their storehouse of knowledge with someone whom they do not know. They are concerned about the decline in biodiversity and ask for involvement of all sections of hill people in preserving the same.

CHAPTER III

SCOPE OF CROP DIVERSIFICATION TO SUPPORT LIVELIHOOD OF MOUNTAIN COMMUNITIES IN INDIA

1. Introduction

The increasing consolidation of the World Trade Organisation (WTO) regime is gradually encompassing more and more areas of production (beyond manufacturing) activities in the fold of a new world order. As the shadows of this global scale centralisation and standardisation of apparently economic activities are getting bigger, it is going to strongly affect livelihood, tradition, culture, customs and habits of the people in the developing countries. In particular, the decision to bring the agricultural sector within the ambit of a disciplined global regime defined by the WTO will bring in far reaching changes in the Indian agriculture.

The Agreement on Agriculture (AoA) seeks “to establish a fair and market-oriented agricultural trading system”, which is largely an alien concept in the context of Indian agriculture

The Agreement on Agriculture (AoA) under the WTO regime seeks “to establish a fair and market-oriented agricultural trading system”, which is largely an alien concept in the context of Indian agriculture. Equally distant are the issues of public stockholding and market access (for food security purposes) to at least some major areas of agriculture that are still somewhat quarantined, but would become, in near future, a global playing ground for the multinational corporations (MNCs). The most crucial impacts are likely to come from the Agreements on Trade Related Aspects of Intellectual Property Rights (TRIPS) and Sanitary and Phytosanitary (SPS) Measures. It is observed in some scholarly studies that while the former aims at extending patent or a patent-like protection to agriculture, the latter seeks to introduce strict health and safety regulations. Through both these Agreements, norms and standards existing in the developed countries are being extended to developing countries.

An enquiry into the livelihood of mountain communities, the crop composition in mountain agriculture and the possible scope of crop diversification and alternative livelihood strategies need to be analysed

The mountain agro-economic regions of India which stretch in the north-western part of the country over the states of Jammu and Kashmir, Himachal Pradesh, and the Kumaon and Garhwal areas of Uttaranchal (formerly part of Uttar Pradesh) as well as in North-East covering seven states (popularly known as the ‘Seven Sisters’ of North-East India), i.e. Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura, present a very important case as far as the possible impacts of the WTO are concerned. But, unfortunately, the mainstream academic discussions and studies have given extremely inadequate attention to the mountain regions of the country; the thrust of the mainstream literature is on the plains. The study of the existing conditions of those regions, an enquiry into the livelihood of the mountain communities, the crop composition in mountain agriculture, and the possible scope of crop diversification and alternative livelihood strategies need to be looked into for a proper understanding of the impacts of the WTO Agreements on farmers’ rights to livelihood in the Hindu-Kush Himalaya (HKH) region. This report is an account of the outcome of a research study undertaken during mid-March to mid-July 2002 to that effect. The field study for the project was carried out during April-May.

The parameters of the research were to study:

- a. the current state of farmers in the mountain regions;
- b. the dependence of farmers/local communities on forest resources;
- c. the need for crop diversification and its implications;
- d. the impact of economic liberalisation on the mountain communities;
- e. the existing legal frameworks in light of farmers' rights; and
- f. the stakeholders' involvement.

2. Research areas

Six districts from two states of the north-eastern region covering 77 villages and a total of 245 households and two districts from the Garhwal (Uttaranchal) region covering 30 villages and a total of 90 households were sampled for the research.

Given the constraints, a multi-stage sampling method was followed

Given the constraints, a multi-stage sampling method was followed. The states were chosen purposively; the diversity aspect was kept in mind, and the two polar extreme zones were given consideration; because, the Garhwal Himalayas, by all secondary evidence, present a very different picture from the north-eastern Himalayas. The choice of Assam, on one hand, and Meghalaya, on the other, had been prompted by the fact that large parts of Assam are lowland hill areas whereas Meghalaya is characterised by highland. Besides, according to the Basic Statistics of the North-East Region, 2000, published by the North-Eastern Council, Assam is one of the low urbanised areas of North-East whereas Meghalaya is just the opposite. Also, a much higher percentage of the agricultural population in the hills of Meghalaya practice traditional shifting cultivation method than in Assam; the percentage of forest covers of the two states also vary significantly.

In the second stage, the districts and the villages were selected in consultation with two partner organisations, the Bosco Reach Out (BRO) for North-East and the Rural Litigation and Entitlement Kendra (RLEK) for Garhwal. These were also purposive samples chosen with the consideration of capturing diversities of the regions and the accessibility and logistic convenience.

But, as the sample size is limited and the stratification is not comprehensive, the results of the survey are more indicative rather than statistically representative of the entire population

Finally, 326 households from six districts of North-East and 90 households from the villages of two districts of Garhwal were selected. Thus, the present study has been virtually a pilot study for a more extensive and intensive study of the subject in future. Apart from the sample survey, valuable information was gathered regarding the area characteristics and agricultural practices, from interactions with the survey facilitators in North-East and a cross-section of the villagers. But, as the sample size is limited and the stratification is not comprehensive, the results of the survey are more indicative rather than statistically representative of the entire population.

3. State of farmers

In this section, the major activities of the mountain communities in the sample areas have been studied, particularly in relation to their livelihood issues. The occupational composition shows that cultivation and non-timber forest products (NTFPs) collection remain overwhelmingly dominant

occupations of the mountain communities in North-East and Garhwal. Most of the sample households in each of the villages of two regions vindicate this observation. In Garhwal, livestock farming (especially, sheep ranching) is an additional significant occupation, particularly in the distant highland villages like Tehri.

Very few people are service holders in most of the sample villages in North-East. They are engaged either as school teachers in the local village schools or as ordinary staff in the forest departments of the state governments or as drivers in the forest offices. In Garhwal, however, service holders were rare in the sample households.

The extreme dependence on NTFPs apparently indicates the poverty of the local population. The people and their livestock largely depend on NTFPs for survival

The extreme dependence on NTFPs apparently indicates the level of poverty of the local population. The people and their livestock largely depend on NTFPs for survival. They gather fruits and inferior edibles as well as medicinal herbs from the forest. The importance of forest, therefore, cannot simply be overemphasised in the life of the people of the region. However, owing to indiscriminate felling of trees, the forest is being depleted largely by external agencies and unscrupulous timber traders. On top of this, a good many laws and rules have been promulgated by the central and state governments with the avowed intention of protecting the forest from depletion.

Besides, there are views, and even a number of the villagers themselves believe or have been made to believe, that the 'shifting cultivation' (*jhum*) practised by them causes forest depletion. The Forest Survey of India, Dehradun, 1998 indicates the same. But there are controversies in this regard as it is also argued that shifting cultivation helps in natural recovery and enhancement of productivity of the once cultivated forestland during the interim years of abstinence. Since North-East is almost entirely a heavy-rainfall area, the forest undergrowth takes place quickly.

In the Goalpara district of Assam, in particular, and in Karbi-Anglong, to some extent, rubber/tea/coffee plantation is a burgeoning activity. Rubber plantations, introduced in Assam in recent years by the Rubber Board of the Government of India, have proved to be a highly profitable venture and more and more households are slowly taking to rubber plantation as a livelihood alternative.

4. Crop diversification

In North-East, paddy is a major crop for a vast majority of the households, especially in Assam. In the Karbi-Anglong district of Assam, and in West Garo hills and Ri-Bhoi districts of Meghalaya, vegetable cultivation is the second major occupation. Apart from summer and winter vegetables, ginger has become popular as a cash crop in recent years in the East-Garo hills and Ri-Bhoi districts. But its yield and market demand have been sharply falling over the last one year or so.

In Garhwal, wheat is a very important crop followed by potatoes

In Garhwal, wheat is a very important crop followed by potatoes. Pulses like *chhimi dal* and *kulath* are also important crops and so are *rajma* and *mandua*. *Cholai* is yet another popular crop, particularly in the Uttarkashi district.

It was observed that most of the major crops (except cash crops) – like paddy, wheat, pulses, and summer and winter vegetables – provide staple

The traditional crop diversity had the in-built characteristics of sustainable production/consumption and food security of the people

consumption to the villagers; these are therefore produced first (and, in several instances, exclusively) for domestic purposes, and then, the surplus, if any, is sold in the market. Farmers from Dehradun¹ stated how the traditional practice of 'composite vegetable cultivation' (the *Barah Anaj* or 'Twelve Grains Farming') would take care of the balanced sustenance of soil nutrition, on one hand, and the balanced diet requirement of the rural household on the other. Thus, the traditional crop diversity had the in-built characteristics of sustainable production/consumption and food security of the people.

Going by agricultural inputs, the farmers in the highland areas of East Garo hills and Ri-Bhoi districts largely use indigenous seeds, manures, pesticides and implements. Their counterparts in Assam and Garhwal use dominantly, if not entirely, seeds, fertilisers, pesticides and implements in their cultivation, all purchased from the market. However, the cultivators of Garhwal were quite vocal about the adverse impacts of chemical fertilisers on the soil, as they had experienced that increasing doses of the same were required over the years to maintain the same level of productivity of land(per acre). This indicates eroding natural fertility of the soil. But once they had taken recourse to the chemical fertilisers, it would not be possible for them to change over to natural manures overnight, or even in the short run, because the land would need to be left idle for a couple of years to recuperate its eroded natural fertility. The implication of all this is that improvisation and modernisation in the agricultural practices have to be done, keeping in mind the pros and cons, and also the multifarious merits of the indigenous practices.

5. Livelihood options

A peculiar type of 'crop', called broomstick (grass), may be mentioned which grows in the forests of Meghalaya. Many villagers cultivate it because of its good revenue potential. Twenty-five out of 120 sample households of Ri-Bhoi district grow broomstick and sell in the market because it is in good demand. There is a need to explore further possibilities of developing it as a viable cash crop in the region.

Among the cash crops, Betel nut is widely grown in large parts of the Goalpara district of Assam and to a lesser extent in the Garo hills, particularly in the east. Similarly, rubber is recently gaining ground particularly in some parts of Assam and Meghalaya. Flowers and orchids of wide and exclusive varieties and fruits of high quality that grow abundantly in these parts can also be developed as major cash crops. Sericulture is also practised in Meghalaya.

Making handicraft items is a leisure-time occupation for the people in many areas of mountain regions. In North-East, particularly in the Ri Bhoi district of Meghalaya, 30 out of 120 households make various types of handicraft items from bamboo and cane, which are widely available in the areas often as a free gift of nature. There are many varieties of handicraft items like bamboo baskets, bamboo mats, cane baskets, cane tools, bags and clothing made from the locally available yarns. These often bear the unmistakable stamp of local ethnic designs and patterns, motifs and icons that vary distinctively from state to state. Even though, they usually make these casually in their lean hours, the products are the outputs of enviable skills, and are reproduced over generations. These products are available for domestic use as well as for sale in the market.

Making handicraft items is a leisure-time occupation for the people in many areas of mountain regions

As the demand for ethnic products is steadily growing at home and abroad, handicrafts of the hill communities bear a good potential as a livelihood strategy

It is important to understand that these people can be motivated to develop their products through diversification strategies, including experiments in product design, hybridisation and adequate marketing strategies. The point is that as the demand for ethnic products is steadily growing at home and abroad, handicrafts of the hill communities bear a good potential as a livelihood strategy. The reasons for lack of commercialisation of the handicraft products by the mountain people themselves are explained largely by their weak market-orientation, which precludes any attempt towards experiments in product diversification and modification, including changes in design and features. The question of capital deficiency is, therefore, redundant. Further intensive studies are required in this regard.

The benefits of the revenue earned must be properly shared by the concerned producers and not siphoned away by the intermediaries or mediating agencies and the end-point sellers, as is the current trend. The government should be more vigilant and devise ways to protect the farmers in this respect. Obviously, the conventional passive role of the Handicraft Boards is not going to be sufficient to make this happen.

6. Dependence on forest resources

The importance of forests had been studied partially and already mentioned in respect of NTFPs and medicinal herbs. It transpires that *Neem, Tulsi*, and various types of bitter herbs are popularly used in North-East, and herbs such as *Atees, Kaudai, Hathpanja and Salampanja, Meetha, Kutki, Bukhar ki jadi, Kashmir ki jadi* are widely used in the villages of Uttarkashi and Tehri-Garhwal. Almost everybody uses some medicinal herbs as preventives or curatives for various ailments and maladies. This shows that for the mountain people, medicinal herbs are still effective remedies of illness. The mountain regions (North-East in particular) that are rich in such herbs should make a record of all the medicinal plants available in a particular locality with their characteristics, uses and applications.

The Community Biodiversity Registers (CBRs) are to be prepared extensively for different areas and communities because a section of the concerned stakeholders are apprehensive of the possibilities of biopiracy

The Community Biodiversity Registers (CBRs) are to be prepared extensively for different areas and communities because a section of the concerned stakeholders are apprehensive of the possibilities of biopiracy and smuggling out of invaluable traditional knowledge ultimately to the unscrupulous people, organisations and institutions. In this process, the poor villagers – so long the exclusive creators, developers, custodians and users (over generations) of the traditional knowledge – would be deprived of this indigenous knowledge and be made dependent on the market. Their life security would be adversely affected. The relevant departments of the central and state governments and academic and research institutions and non-governmental organisations (NGOs) need to do a lot of research on the medicinal herbs to come out with effective ayurvedic medicines/cures.

7. Impact of liberalisation

Amid reports of ongoing research by certain multinational pharmaceutical companies on local herbs, the TRIPS Agreement and its patenting aspects could have far-reaching impacts on the mountain communities and their

The north-eastern region is a 'biodiversity hot-spot' and extremely rich in medicinal and aromatic plants

medicinal plants/herbs. The north-eastern region is a 'biodiversity hot-spot' and extremely rich in medicinal and aromatic plants. Despite using these herbs generation after generation to cure various diseases, villagers in these regions have no theoretical and medicinal documentation on these herbs and their pharmaceutical properties. On top of that, they are unaware of the WTO, let alone its implications.

The survey glaringly revealed this ignorance in one hundred percent cases covered. The rich medicinal resources of mountain communities, therefore, are open to plunder and vulnerable to commercial interventions by MNCs. The survey also revealed that the villagers in the Ri-Bhoi district of Meghalaya and in both the Uttarkashi and Tehri-Garhwal districts of Uttaranchal are major users of foreign products (mostly imported from China and Indonesia) – particularly cosmetics, clothes and electrical/electronic products.

The poor villagers of Tehri-Garhwal and Ri-Bhoi districts, though depend largely on NTFPs, wear foreign clothes and use foreign cosmetics

In the era of globalisation and liberalisation, more imports to these regions are likely to flood the consumer market in the near future. It is apparently paradoxical but true that the poor villagers of Tehri-Garhwal and Ri-Bhoi districts, though depend largely on NTFPs, wear foreign clothes and use foreign cosmetics. The reasons for preferring foreign products were cited as better packaging, better advertisement, ready availability and better quality. So a section of the mountain communities, particularly those near or along the way to places of tourist attraction, have already become attracted to foreign imports.

The substantial dependence of the mountain communities on various types of NTFPs (like fuel, fodder and honey and for livestock-feed from the buffer zone), orchids and wild flowers (for aromatic and medicinal uses as well as for ornamental uses) and traditional production methods and consumption practices largely ensure their food security and basic minimum livelihood. In fact, the question of livelihood of the mountain people has to be viewed in the comprehensive context of their access to food, occupation, inputs and implements as well as their control over the production process. Peripheral factors like easy and costless access to medicines from forest resources to livelihood security should also be seen in this perspective. It was observed that fruits of wide ranging varieties and exquisite quality grow on their own in various parts of Garhwal and North-East as a means of livelihood for the mountain people.

8. Awareness on existing legal framework

The survey revealed the villagers' total ignorance about the legal provisions pertaining to their life and livelihood

The survey revealed the villagers' total ignorance about the legal provisions pertaining to their life and livelihood like the Farmers' Rights Act and the Biodiversity Bill. Let alone about the WTO and TRIPS, they were not even aware of the local rules and laws relating to the state or local bodies.

In the year 2002, two workshops jointly organised by CUTS and SAWTEE in Dehradun and Shillong on "Mountain Communities and Farmers' Rights: Where We Stand?" underscored the need for strong networking among the stakeholders with regard to preparing CBRs in the mountain regions as well as sensitising the villagers about the farmers' rights and the legal provisions in this regard. The academia, the government representatives, and others present at the workshops corroborated this view and drew up resolutions to this effect.

9. Main findings

The salient findings of the survey can be summed up as follows:

Cultivation for agricultural production is the most dominant livelihood strategy among the surveyed mountain communities

- a. Cultivation for agricultural production is the most dominant livelihood strategy among the surveyed mountain communities. Livestock farming is another major livelihood strategy, particularly in Garhwal. While the main crops are paddy and vegetables in North-East, wheat and potatoes (along with paddy) are in Garhwal. *Chhimi dal* and *Rajma* are also significant crops in the latter area. However, the mountain people in general suffer from limited livelihood strategies and crop diversity options.
- b. Mountain people, especially in highland, are mostly poor and depend substantially on forest products and NTFPs for their survival.
- c. Most of the crops are produced mainly for domestic consumption. The surplus, if any, is then sold in the market. The case with the cash crops is different.
- d. The mountain areas are rich in medicinal herbs and villagers use them widely for cure and prevention of their ailments without any sound knowledge about them. These may be developed as important alternate crops leading to a gainful livelihood strategy.
- e. In some areas, handicraft products bear the stamp of sound skill and competence. But these are mainly produced for domestic consumption, and are sold, if at all, at throwaway prices.
- f. In some of the mountain areas, especially in the hill plains or areas near hill towns and tourist spots, chemical fertilisers and pesticides are widely used. Villagers know their adverse effects, like long-term loss of natural nutrients of the soil but they have become increasingly dependent on them.
- g. In some of the hill areas (Ri-Bhoi district of Meghalaya and in the Garhwal areas), foreign products have made inroads, mainly in clothing, shoes and cosmetics. The villagers find them better in packaging, availability, advertisement and quality.

Villagers have become increasingly dependent on chemical fertilisers despite the knowledge of their adverse effects

10. Recommendations

The policy recommendations emerging from the survey are:

The amazing variety of flowers and orchids (which grow abundantly in North-East) - rarely available in the plains - can be grown on a commercial scale

- a. Livelihood strategy options should be expanded in terms of gainful alternatives; some cash crops like potatoes and other vegetables are to be given additional incentives; and plantation products like rubber are to be encouraged (given their newly discovered potential in some parts of North-East). These should be done within limits defined by their food security constraints and their livelihood requirements.
- b. The favourable agro-climatic conditions for growing fruits like orange, pineapple, guava, banana, apple, pear and other (citrus) fruits that are already grown in Garhwal and North-East have to be fully exploited. The potential for growing them on a large scale (over and above their subsistence level) has to be explored with an assured support system of food processing and marketing the disposable surplus.
- c. The amazing variety of flowers and orchids (which grow abundantly in North-East) - rarely available in the plains - can be

A Farmer's Insurance Scheme for their crops, and particularly for their highly perishable produce (like fruits, flowers and orchids) has to be developed

grown on a commercial scale with adequate facilities for preservation and transportation, or even promoting joint venture with cent percent buy-back guarantee.

- d. A Farmer's Insurance Scheme for their crops, and particularly for their highly perishable produce (like fruits, flowers and orchids) has to be developed, especially in view of the vulnerability of the farmers in the mountain regions to the extremely unpredictable weather conditions and the lack of adequate storage facilities.
- e. Farmers have to be extended technical support to save indigenous seeds for free exchange through village-based seed banks; and for more productive and sustainable agricultural practices using traditional knowledge for organic farming and intercropping for better yield.
- f. CBRs as a priority task are to be prepared as extensively as possible with the involvement of the local people. This will help to ensure the rights of the local community in general and the farmers in particular over their plant resources including all indigenous varieties, wild relatives and cultivars as well as lifescape and landscape at village level, list of plants, abundance, rarity, uses location of occurrence in a given village. To this end, necessary training programmes have to be arranged.
- g. Training in product diversification (including design, use, processing and packaging) and customised product development are needed along with more active marketing strategy for agricultural as well as handicraft products with the direct producer as a proper benefit sharer.
- h. Sensitisation of the mountain communities at all levels, especially of the poor farmers with regard to the WTO and the legal provisions on farmers' rights and the local rules and laws need to be taken up as a priority.
- i. An extensive networking with local NGOs, concerned government offices and agencies, academics and professionals needs to be built up for a continual monitoring, motivating, training and supporting exercise in close interaction with the mountain communities. The training/awareness programmes would be particularly necessary for the preparation of CBRs, product diversification and sensitisation programmes.
- j. Training of trainers (TOT) programmes for local NGOs/CBOs have to be undertaken so that they could lead various training and sensitisation programmes in mountain villages.
- k. Rich reservoir of local traditional knowledge of using medicinal plants needs to be substantiated through modern laboratory-based research, and a benefit-sharing mechanism (as established by Tropical Botanical Garden and Research Institute, Trivandrum for the Kani tribe in Kerala) for those communities who acted as 'conservator and provider' of valuable knowledge over the centuries.
- l. An extensive large sample survey is to be taken up as comprehensively as possible for capturing great diversity of plant resources, cropping pattern, livelihood, and traditional knowledge of the mountain communities across the HKH region.

Training of trainers programmes for local NGOs/CBOs have to be undertaken so that they could lead various training and sensitisation programmes in mountain villages

CHAPTER IV

DYNAMICS OF HILL FARMING SYSTEM IN NEPAL

1. Background

Farming systems in practice are based on resource endowment and management/utilisation system of the people

Nepal is small in geographical area and population compared to other countries in Asia. There are three distinct ecological belts namely Himalaya, Hill and Terai. The ethnographic distribution of people in these three eco-regions is quite different. Farming systems in practice are based on resource endowment and management/utilisation system of the people. Agriculture is still traditional. Animal husbandry is one of the important means of livelihood for the majority of the population in the hills.

A comprehensive study on *Indigenous Knowledge and Traditional Practices of Farmers in the Hills of Nepal* was carried out to document issues relating to indigenous knowledge and traditional practices, with a view to exploring direct impact on development, utilisation and conservation of potential indigenous knowledge/practice to secure sustainable livelihoods of the farming communities in the Hindu-Kush Himalaya (HKH) region of Nepal.

2. Study scenario

The study was carried out in three Village Development Committees (VDCs) of Panchthar, Kavre and Lamjung districts representing eastern, central and western regions of Nepal respectively from March to June 2002. The research team collected data by interviewing 230 respondents, using random sampling method. Rais/Limbus, Tamangs and Gurungs dominated the respondents, hailing from 12 different ethnic groups. Majority of them were literate. Farming is the only means of livelihood for almost all the hill communities.

3. Hill agricultural system

Crop, livestock and forests are the three major components of farming systems in the hill regions. Farming communities depend on traditional methods for land cultivation, manuring, and inter-cultural practices and diseases and pest control, harvesting, threshing and post harvest management of agricultural commodities. Farming in the hills is predominantly rain-fed.

3.1 Crop

The productivity of maize and millet in the selected districts is higher than national productivity

Cereal crops are grown by the hill farmers in the following priority order: maize, rice, millet, wheat, buckwheat and barley. Besides these, a considerable number of farmers are growing potatoes, seasonal vegetables, spices, and fruits and a few households also grow mustard and various legumes, primarily for domestic consumption. However, in Kavre district, some farmers are growing potatoes and vegetables such as tomato, bitter gourd, cabbage and cauliflower for commercial purpose. The productivity of maize and millet in the selected districts is higher than national productivity, whereas the productivity of rice and wheat is slightly

lower than the national productivity. The productivities for all crops are higher in Kavre than in Lamjung and Panchthar.

In the past, maize cultivation played a vital role in the hill farming system, as it was the major staple food for the majority of the people. But within last few decades, food habits of the people in the hills have been gradually changing. They have started preferring rice to maize. Consequently, maize has become the main item used in animal feed. The demand of maize for human consumption has decreased, yet farmers are compelled to grow it due to lack of other alternatives. Another trend observed was that farmers living in the areas, which are accessible to the market are replacing their traditional (cereal) crops with cash crops like seasonal vegetables and fruits.

3.1.1 Cropping patterns

Depending upon the availability of water for irrigation, altitude and types of soil, farmers grow two to three crops a year

The common cropping patterns followed in *Bariland* (where water is not abundant) are maize based and other minor crops grown include: millets, barley, wheat, potato, mustard, soybean, cowpeas, and black and green grams. *Khetland* (where water is abundant in supply), having possibility of irrigation facility from nearby streams, is terraced and used for rice cultivation. Cropping patterns are generally rice based. Depending upon the availability of water for irrigation, altitude and types of soil, farmers grow two to three crops a year. The marginal land is normally used for growing legumes.

3.1.2 Seeds and seed management

Locally produced seeds are the main source of seed supply. Farmers use same seeds for several generations from their own crop. Other sources of seeds include purchased (from the market) or exchanged (with neighbours) ones. The role of private seed suppliers and agricultural development centre in seed supply is minimal.

Farmers collect seeds from healthier crop stand and process by drying the grains under the sun for several days. They store them taking measures against possible damages. They normally mix ashes and/or different locally available herbal leaves to keep grains insects free. Seeds are normally stored in the traditional *Bhakari* (big basket) available locally and made up of rice straw or bamboo or *Ghampo* (a large earthen pot). Farmers usually do not apply chemicals or any kind of treatment. However, the traditional seed storage system is gradually disappearing, partly due to use of purchased seeds. The demand for hybrid seeds is increasing but their supply is inadequate to meet the demand.

Despite many advantages of local crop varieties, farmers are being inclined to use the improved variety

Despite many advantages of local crop varieties like demanding low cost inputs, having higher resistance to insects and pests, ability to thrive well in local climatic and soil conditions and better taste, farmers are inclined to use the improved variety solely due to higher production potential of the latter. In this scenario, most of these local varieties/breeds are gradually being replaced and losing their resistance. Since local varieties have become susceptible to pests and insects attacks, farmers are compelled to gradually substitute the low yielding local varieties with high yielding improved varieties. Here, the crucial question arises as to why the farmers should stick to the low yielding local variety.

They also know that use of chemical fertilisers results in deteriorating soil quality in the long run

3.1.3 Soil management and Farm Yard Manure (FYM)

Farmers are aware of the use of FYM, which is the best means for increasing the soil productivity. They also know that use of chemical fertilisers results in deteriorating soil quality in the long run. However, due to easy availability and immediate positive result of chemical fertilisers, they prefer to use chemical fertilisers thereby getting rid of labour-intensive cattle raising practice. Consequently, the supply of FYM has been decreasing and the productivity is directly affected.

3.1.4 Crop insect-disease management systems

Insects and pests are widespread in all crops. Farmers have adopted indigenous/traditional methods based on their experience in controlling insects and disease. Those traditional methods are less effective as compared to chemical pesticides. Therefore, chemical pesticides, where available, are gaining popularity among the farmers, and the trend of using them is also increasing. However, majority of the farmers do not know about the proper application of pesticides. There is very limited knowledge on the product, dose, time and technique of use and precaution to be taken. They keep on using pesticides until they see visible negative impacts. Therefore, there is very possibility of pesticides being used in over dose. Its overuse has adverse implications like deterioration in quality of product and environment. It also affects the health of people and animals, and builds resistance among insects and pests. Though some farmers are conscious of the negative consequences of chemical pesticides, they continue to use them. However, one positive aspect is that they use chemical pesticides only if traditional methods do not produce any result.

3.1.5 Post harvest practices

Farmers store cereal grains by traditional methods, keeping them free from rats, grain weevils, and fungus in the store. No chemical or other kind of treatment is in use. Grain flies and weevils are the major problems for them. Farmers do not know the exact level of post harvest losses of grains in the store and the overall post harvest losses of grains experienced by majority of them. Generally, these losses are within acceptable range under normal storage condition.

3.2 Livestock

The average productivity of livestock and poultry in the study sites is close to the national average

Livestock is an integral part of the hill farming systems of Nepal. Majority of farmers rear different types of livestock for various purposes. Buffaloes are raised mainly for milk and manures; cattle for draught and manures; and sheep, goats and poultry for meat and supplementing cash incomes. Farmers rear animals according to their socio-cultural traditions, needs and suitability in the local environment.

Almost all the animals found in the research sites are of local breeds and are being raised under traditional systems. However, farmers in Panchthar district are also rearing crossbred *Jersey* cows. The average productivity of livestock and poultry in the study sites is close to the national average. The higher milk yield of cows in Panchthar district, which was noticed during the study period, is probably due to the fact that they reared crossbred cows. Poultry is the most common species raised by all caste and ethnic groups primarily for home consumption as it is easy to raise

Cattle are raised mainly for the purposes of milk, meat and manure

and affordable for consumption. Cattle are raised mainly for the purposes of milk, meat and manure. Some animals like oxen are reared for the purpose of tilling land in the hills.

Cows and buffaloes are almost equally popular among all the hill communities. The cows have religious importance for almost all raisers but religion itself does not have any significant relationship with the choice. Main deciding factor for the choice of both types of animals is the capability for investments and the rate of economic return. Goats are popular among all caste and ethnic groups, whereas, sheep are popular mostly among Gurungs and pigs among Rais/Limbus.

3.2.1 Feed and fodder

Livestock is mostly kept under sedentary system. However, farmers have been gradually opting for stall-feeding practices. Farmers in high altitude keep the animals under transhumance system, as the number of animals is unmanageable and there is large grazing land for animals. Seasonal green grasses, fodder and different types of straws are the main feeds for all types of ruminant animals. Farmers normally manage green fodder and forage from their own cultivated resources and some from community forest. Other sources, though nominal, are government and leasehold forests, and different types of straws harvested from cereal crops that mostly come from their own farms.

3.2.2 Livestock diversity

Most of the animals are locally bred as they are well adopted in the local environmental conditions. However, some *Murrah* buffaloes, *Jersey* crossbred cows and *Jamunapari* goats are found introduced albeit nominally. Farmers tend to keep local bulls as they are adaptable to local environments, easy to raise and useful for plowing. Moreover, unlike improved breeds, they do not need any sophisticated management practices.

3.2.3 Livestock disease

Despite practicing since long, majority of the farmers do not have in-depth knowledge about the traditional methods, which include use of medicinal herbs and chanting of mantra

Majority of the farmers are somewhat ignorant about the incidence of diseases in their animals. Farmers believe that major causes for animal illness are infection by various insects, attack by wild animals, and exposure to poisonous grasses, reproductive disorders and physical injuries. Though modern veterinary practices are gradually gaining roots, they are not common and farmers still depend on faith healers for treatment of their animals. Despite being practiced for long time, majority of the farmers do not have in-depth knowledge about the traditional methods, which include use of medicinal herbs and chanting of *mantra*. It has been noticed that farmers' dependence on modern veterinary drugs is increasing.

3.3 Forest and agro forestry

Forest plays a significant role in the hill farming systems, particularly in the livestock keeping system. Traditional grazing and transhumance, a system of rearing animals, are gradually substituted by stall-feeding system across the hills. Availability of seasonal green grasses, fodder and different types of straws affects the livestock rearing system. Farmers are increasingly

confined to their limited cultivated land for producing green fodder and forage for the livestock. Most of the national forests have been managed as government, community, and leasehold forests, and the supply of fodder and forage from these forests is very nominal.

There is a considerable diversity in the fodder tree, shrubs and ground forage species and utilisation patterns among regions

Agro-forestry is an age-old practice of the hill farming system. There are 28 fodder trees and shrub species and 22 ground forage species in use. It shows that there is a considerable diversity in the fodder tree, shrubs and ground forage species and utilisation patterns among regions. Some species of fodder trees such as *Kutmiro*, *Badahar*, *Khanayo* and *Tanki* are commonly grown in all regions. Exotic varieties of fodder trees too have been nominally introduced. Similarly, ground forage species, like *Banso* and *Siru* are the most commonly used species. *Khar*, *Gandhe*, *Dudhe* and *Kans* are other species that fall in second priority. Some farmers due to various reasons do not use some ground forage species. *Dudhe*, *Gandhe*, and *Banso* belonging to weed species are found abundantly in the maize field between June and October. Other remaining species are grown naturally in inferior land areas without having to apply time, energy and resources. No formal studies have been carried out about these native forage species in Nepal and very little is known about their ethno-botany, nutritive values and potential roles in conserving the sloping landscapes and feed supply, particularly during the dry winter months. However, the consciousness of farmers towards protection of fodder trees and shrub species on the private marginal land is growing in the hills.

3.3.1 Farm-forestry linkages

The contribution of forest to animal fodder, fuel wood and many NTFPs has decreased and farmers are in search of developing alternative strategies to meet their needs

The inter-dependence of crop-livestock-forestry found in the traditional integrated farming system in the hills is gradually breaking away due to change in the government's forest policy forcing the farmers to change the system of livestock keeping. The traditional knowledge and practices of farmers regarding the use of forest have changed significantly over the years where new forest management systems have been introduced. The contribution of forests to traditional farming system has been decreasing and the system is being modified to suit the changed context. The contribution of forest to animal fodder, fuel wood and many NTFPs has decreased and farmers are in search of developing alternative strategies to meet their needs. Communities are planting fodder tree, forage and even NTFP species in private land and marginal areas of cultivated lands to supplement the fodder for animals, fuel wood. They are even opting for modern medical services in place of traditional herbal therapy for treating and curing the livestock diseases and ailments. Consequently, the FYM production has decreased and farmers are forced to use chemical fertilisers to grow food crops to meet their family requirements.

3.3.2 Agricultural development and agro-biodiversity

The rich agro-biodiversity of crops and animals found in the hills has already reached to an absolute limit as majority of the households has been growing a single variety/breed (either improved or local). This implies that majority of the farmers are gradually adopting improved variety of crops, if available, and giving up their traditional practices. But they generally use local varieties and breeds due to economic reasons. While this is the general trend in the case of cereals and pulses, it is quite marked in the case of vegetables.

3.3.3 Research and extension policy and adoption of improved technology

The farmers are reluctant to adopt improved package-technology as the government's support and recommended inputs are not reliably available in local markets

Most of the hill farmers find it difficult to comprehend the recommended improved package-technology for crops and livestock. Moreover, these packages need higher level of technical knowledge, more time, and patience, and costly external inputs. The farmers are reluctant to adopt these packages as the government's support and recommended inputs are not reliably available in local markets.

Moreover, the rate of adoption of improved crop and animal production technologies by farmers has also been very low despite extensive research and extended networks for their promotion. Majority of the farmers are neither aware nor have access to free agricultural and livestock extension services provided by the government and non-government sectors. The recommended packages have not solved farmers' problems, as they are not compatible to local needs and environmental conditions. Despite such difficulties faced in adopting the improved technologies, most of traditional practices of land preparation and management of crops and livestock are not in place either.

3.3.4 Livelihoods and food security

The food grains produced for majority of the farm families in hill regions is not adequate to meet their requirements. Therefore, they are looking for alternative methods of farming and other means of livelihoods for supplementing the family income. Farming is not only an occupation but also a way of life for the hill people. It is attached to socio-cultural value system. However, traditional farming practices related to the indigenous knowledge have gradually been disintegrated partly due to the government's market-oriented agricultural policy and fast eroding socio-cultural value system in rural areas.

3.4 Problems of hill farmers

The overall productivity of crops and livestock has not increased, food sufficiency at household level has not improved, and dependency of farmers on external inputs has increased

The main problem of the hill agricultural systems is lack of irrigation facility. There is neither explicit governmental policy for extending irrigation facility in the hills nor specific programme for developing rainfed agricultural technology for hill regions. Thus, majority of the farmers in the hills have not benefited from the government's agricultural policies and programmes. Agricultural development policy and programmes in the past focused mainly on replacing the traditional practices of farmers and attention was not given to the implications of new interventions. As a result, the overall productivity of crops and livestock has not increased, food sufficiency at household level has not improved, and dependency of farmers on external inputs has increased continuously to maintain productivity levels. Despite considerable annual investments in agricultural sector, new recommended technologies have not reached to the majority of farmers, even in the vicinity of district headquarters of hill regions.

In the past, agriculture was influenced by various socio-cultural value system of the community. With the introduction of the improved technology, the traditional farming system is being gradually disintegrated from the socio-cultural belief of the community. However, some of the communities still follow the cultural rituals and religious taboos for growing crops and raising animals. For instance, some of the hill tribes grow millets

for preparing *raksi* and *jand* (locally brewed alcoholic drinks), which are, for some castes, considered necessary for various socio-cultural and religious ceremonies.

4. Recommendations

4.1 Documentation of local community resources

There is a need to document the local knowledge and practices of each and every ethnic community found in the major agro-eco-zones throughout the country. The recommendations are:

A national coordinated research and documentation process should be initiated by the government agency

- a. A national coordinated research and documentation process should be initiated by the government agency utilising existing agricultural and forestry research and extension networks in the country.
- b. Adequate attention should be given to identify and document the rational indigenous knowledge and traditional farming practices of various communities.
- c. Some traditional knowledge and practices of the local communities have a scientific basis and many are considered as superstitions/taboo. Therefore, there should be a comprehensive study on indigenous knowledge and traditional practices of different tribes/ethnic communities to segregate potential indigenous knowledge and practices from their socio-cultural taboos, superstitions, values and belief systems to refine local practices for their benefits.

4.2 Research and development for conservation and utilisation of local resources

Each community has its own specific knowledge and practices that need further research for improvement. The research and development programmes in agriculture, forestry, and medical fields should be guided by a national policy. The recommendations are:

- a. Given the nature of hill farming systems, research on crops and livestock should be focused on developing suitable crop and livestock production technology, which could help solve the problems being faced by farmers.
- b. Recommending a crop variety and livestock breed has multidimensional implications in local farming and social systems so that the varietal release committee could consider all possible linkages of traditional varieties.
- c. Limited knowledge of scientists has shown that genetic potentialities of known local crop varieties and animal breeds are generally lower than the improved ones. Farmers fully understand this fact. However, majority of them are not aware of the long-term impacts of using chemical pesticides, herbicides and fertilisers on physical environments and human health.
- d. Scientific basis should be developed by research to popularise the rational indigenous knowledge and traditional veterinary practices before they are abandoned from the site of origins.
- e. The national veterinary education and research systems should incorporate the indigenous and traditional veterinary knowledge systems in the curriculum of formal veterinary education and

national research policy with due priority.

- f. Research on native fodder and forage species in Nepal is very limited. Therefore, a comprehensive national study on the ethnobotany, productivity, nutritive values and potential roles of different native fodder and forage species in conserving the slopping landscapes and feed supply, particularly during the dry winter months, should be conducted with priority.
- g. The conventional national agricultural research and extension system should be re-oriented to meet the growing specialised needs of the farmers who have already moved towards commercial farming. In order to minimise the likely negative consequences of the liberalised economic policy, a national agricultural research and development system should be put in place to fulfill the technological and marketing vacuum created by structural adjustment.
- h. Low cost site-specific agricultural technology should be developed to discourage purchase of inputs by farmers to make their subsistence living from the farming.
- i. Most of the recommended technological packages do not fit into traditional hill agricultural production systems. Therefore, a separate hill agricultural research policy should be formulated within the Nepal Agricultural Research Council (NARC) to develop site-specific hill agricultural technologies.
- j. Due to lack of explicit national agricultural policy, the farmers' rights are being sidelined in the national economic policy. Therefore, a comprehensive National Agricultural Policy should be formulated and implemented to protect the livelihood rights of farmers and consumers. All existing policies and acts concerning the seeds, pesticides, fertilisers, and agro-industries should be revised to suit in the changing context.
- k. There is an urgent need for a National Seed Policy supported by a strong Seeds Act to encourage farming communities to conserve potential local crop and animal landraces, promote private seed industries and monitor seed markets so that the farmers are protected from exploitation of multinational seed companies and traders in an otherwise market.
- l. The free import of pesticides has been causing a serious problem in Nepal. Therefore, free trading of pesticides should be regulated through explicit import policy and strong pesticide legislation.

The present study has clearly indicated that farmers are looking for suitable farming options to increase both productivity and production from their limited resources. Therefore, the research should focus on developing technologies, which can solve immediate problems of the farming communities. Technologies so developed should be capable of being adopted without extra investments. The principle of marketing adopted by industries need to be applied in generation and dissemination of technologies in agriculture.

CHAPTER V

IMPACT OF TRADE LIBERALISATION ON LIVES AND LIVELIHOODS OF MOUNTAIN COMMUNITIES IN PAKISTAN

1. Introduction

In the era of liberalisation and globalisation, trade is linked to environment, social development, human rights and governance that impact the lives and livelihoods of mountain communities. Market forces now determine the fate of common resources like forests, non-timber forest products (NTFPs), water and grazing lands. Trade liberalisation, under the World Trade Organisation (WTO) regime, might be beneficial in some ways but it could be dangerous when perpetuated and imposed en-bloc on the vulnerable mountain communities. This would have adverse impacts on the livelihoods of these subsistence communities.

Trade liberalisation should not erode rather ensure sustainable livelihood options for the mountain farmers

Trade liberalisation should not erode rather ensure sustainable livelihood options for them. Mountain communities cannot bear the brunt of rapid trade liberalisation being imposed on them with the same yardstick. The way trade liberalisation is being pushed forward in the developing world causes tremendous negative impacts on the development that further marginalises the deprived communities, particularly the subsistent farmers in the fragile areas of Pakistan.

With a view to putting the people of the Hindu-Khush Himalaya (HKH) region at the centre of development, analysing possible livelihood opportunities for them and assessing the vulnerability factors being faced by the farming communities in this region, Sustainable Development Policy Institute (SDPI) conducted a research study in Pakistan's northern areas and looked at the important points in light of the possible impacts of trade liberalisation through "Agreement on Agriculture (AoA)" and "Trade Related Aspects of Intellectual Property Rights (TRIPS)" on livelihoods of the people living in the HKH region of Pakistan.

At a practical level, SDPI started with an analysis of the people's livelihoods and how these have been changing over time under the influence of these Agreements; gathered views of the community members; focused on the impacts of the latest policies and institutional arrangements on the people, households and dimensions of poverty they define; highlighted importance of influencing these policies and institutional arrangements to ensure that livelihood of common people is not threatened; and tried to enable the people to define and achieve their own livelihood goals.

The impacts of AoA and TRIPS were analysed with reference to the risk of vulnerability

The districts of Gilgit and Sakardu of northern areas, part of the HKH region, were selected by SDPI for the research². The impacts of AoA and TRIPS were analysed with reference to the risk of vulnerability, access to public services, rural factor market, and political economy. Community mapping, focus group discussions, and individual interviews were also used as tools to collect data for this study.

During the field research, it was observed that:

- a. Majority of the people in the study area were deprived of basic civic amenities. There is no subsidy or government grant available in this area for their welfare.
- b. Quite a few of them were not happy with the attitude of those in the government agencies.
- c. They want the government to build link roads to markets, provide storage, grading and packaging facilities and set up processing plants.
- d. They define 'poverty' as lack of employment opportunities and financial resources.
- e. Agha Khan Rural Support Programme (AKRSP) has started a marketing programme in some areas to safeguard the people from exploitation of intermediaries. They take AKRSP as blessings for them.
- f. Alfalfa and Potato crops introduced by AKRSP have literally changed the lives of the people; Nulter forests are in good condition only because the people get money for their day-to-day expenditures from potatoes and use Alfalfa as fodder.
- g. The community owned forests are over exploited in Diامر district.
- h. The outsiders are gaining control over their resources.

2. Agricultural sector in northern areas

The farmers divert water from glacial rivers to their fields through a complex system of irrigation channels to grow arable crops and fodder for their livelihood

Around one million people live in the northern areas of Pakistan and most of them are engaged in subsistence agriculture. The region is a semi-arid, situated in the Himalayan rain-shadow. The farmers divert water from glacial rivers to their fields through a complex system of irrigation channels to grow arable crops and fodder for their livelihood. Cultivable land is a scarce resource; and to avoid crop damage, livestock are sent to high altitude, alpine-style pastures in summer. The farming system in Pakistan's northern areas is highly integrated in nature with a high degree of inter-dependence between arable cropping, forestry, and fruit growing and livestock production. Furthermore, there is a close inter-relationship between livestock production within the village precincts and on the high pastures.

The region has emerged as an important producer of fruits and vegetable. The vegetables cultivated in the area include potato, peas, carrots and onion. The fruits produced in the area include apricots, grapes and apples. Like any other agrarian society, livestock is an important source, which provides support and sustenance to the people. Large herds of yaks, cattle sheep and goats are found in the area. Summer is the main agricultural season when maize, barley and vegetables are sown and fruits are picked and stored. Wheat is grown up to an elevation of 2,300 meters only. The region is deficient in food grains and from one quarter to a third of northern area's food grain requirements are met from the produce brought in from the plains.

3. Livelihood strategies of local communities

The level of access to resources and livelihood opportunities is different in various vulnerable and settled groups in the northern areas. The resources are unevenly distributed among communities and hence the livelihood opportunities of the marginalised sections are threatened. Both agriculture and livestock shape the means of sustenance for the people living in these

The events of September 11 had a profound impact on the livelihoods of the people living in the northern areas

high mountain areas. In summer, the communities living around tourist resorts depend on tourism, and seasonal employment in agricultural sector is also common. The migrant workers remit money to their families from across the country and Gulf States as a source of livelihood for them.

Trading has become another source of livelihood. Recently, collection of medicinal plants and other herbs from mountains has emerged as a trend in trading activities. These medicinal plants and herbs are sold in the country through intermediaries. The events of September 11 had a profound impact on the livelihoods of the people living in the northern areas. The closing down of the only winter land-route from Chitral to Peshawar through Afghanistan has created obstacles in the transportation of essential commodities and hampered the flow of people travelling to down-country areas for employment and other reasons. The sealing of its borders by China over Khunjerab Pass resulted in a blockade of Pakistan-China trade of goods and services, and severely affected livelihood of the local people engaged in this trade. Tourist inflow to the region has almost stopped and thus severely affected the local tourist industry.

4. A background of rural factor market

According to the new economic paradigm, modernisation of agriculture entails profound adjustment in farming and rural non-farming sectors. These adjustments are linked to improvements in land, labour, water, forest, and capital markets (rural factor markets). These reforms ought to have a social dimension too. Otherwise, they would turn into an objective in itself and sustainable livelihood would become secondary preference.

A brief summary of rural factor markets including land, water, forest and finance is discussed below:

4.1 Rural land markets

In the northern areas, most of the landowners themselves cultivate their land

In the northern areas, most of the landowners themselves cultivate their land. However, in some areas tenancy system also prevails. The tenancy system in the study areas can be divided in four categories:

- a. *Hijra*: This system is a flexible one where terms and conditions including the duration of the tenancy are established by mutual consent.
- b. *Dehqani*: In this system, owner provides seeds and animals for ploughing and food for tenant. Depending upon the land, whether irrigated or rain fed, tenants get 1/4th or 1/3rd of the produce under this system.
- c. *Ashr*: In this system, tenants do selective work and get a share in the produce on a profit loss-sharing basis.
- d. *Qalang*: Qalang is the leasing out of land to tenants for a specific period of time for a specific amount of money.

4.2 Agricultural water markets

Water supplies either for irrigation or domestic use are entirely from surface water sources i.e. rivers, springs and streams, which are fed by melting of snow in the mountains or through glaciers. The water flow is relatively stable. Wherever water is available, people start cultivating barren hills. Mostly irrigation water is supplied through lift irrigation

techniques. Through financial and technical assistance of AKRSP, a large chunk of cultivable waste land has been transformed into cultivable land.

4.3 Rural forest market

In the case of guzara forests, the forest department acts as an advisor to the community and an arbitrator in the contracts awarded for extraction and sale of forest products

Almost 15.7 percent of the northern areas are under forests. All forests are either the government-owned 'protected forests' or the community-owned 'guzara' forests. The forest department manages the protected forests. According to a report, protected forests in the region are however preserved just in books; and practically they are massively overexploited. In the case of guzara forests, the forest department acts as an advisor to the community and an arbitrator in the contracts awarded for extraction and sale of forest products. The important tree species found in sub-tropical forests are 'chir' pine and blue pine. On some lesser heights, moist temperate forests contain deodar, fir, alder, spruce and oak. Both public and private forests are important to local communities for timber, fuel wood, grazing livestock, and collection of minor forest products such as mushroom, medicinal plants, pine nuts from 'chilgoza' pine. These forests are also habitat for a number of birds and wild animals.

4.4 Rural finance

The formal rural finance market in the area is dominated by some non-governmental organisations (NGOs) working on micro-credit schemes

The poverty-stricken small farming and herding communities of the area have become vulnerable to the commercialisation under market economy-led globalisation. The formal rural finance market in the area is dominated by some non-governmental organisations (NGOs) working on micro-credit schemes. Moreover, there are Small and Medium Enterprises Bank and First Micro-Finance Bank in some areas. However, these credits do not address the basic problems of unemployment, ill-health and poverty. Their stereotype model of development and income generation has disturbed traditional social structure and has created a small class, which depends on NGOs' intervention. Through this system of lending many have turned defaulters by receiving unplanned credits at high mark-up rate of 22 percent for their domestic consumption.

5. Medicinal plants

At present, many plants face a number of threats including that of loss of habitat either due to climate change or due to increased human encroachments

Medicinal plants continue to be an important source for the treatment of various ailment of human kind as well as for the livestock. The northern areas of Pakistan are rich in biological resources and house a large number of plants of medicinal value. District Astore is known as 'store house of medicinal plants'. Very good quality of Kurth or *Saussurea lappa* is found in this area. However, its trade is prohibited under Convention on International Trade in Endangered Species (CITES). Moreover, this area abounds in *Artemisia* spp, *Podiphyllum emodi*, *Ephedra* spp, *Glycyrrhiza glabra*, *Picrorhiza kurrao*, *Aconitum heterophyllum*, *Ferula foetida*, *Onosma* spp, *Rheum emodi*, *Thymus serpyllum*, *Valerriana wallichii*, *Hippophae rhamnoides*, black cumin, salajit and sea buck thorn. These plants are collected without any consideration in terms of their conservation and sustainable use.

At present, these plants face a number of threats including that of loss of habitat either due to climate change or due to increased human encroachments. It is unfortunate that some foreign pharmaceutical companies have already patented certain medicinal qualities of *Artemisia* (used for stomach problems), and *Ephedra* (used to cure Asthma).

6. Results

The study area comprised the following villages:

- *Sultanabad*, Shimshal valley, Roshanabad, Nulter, Galiane, *Jaglot* in Gilgit district;
- *Karimabad*, *Gulmit*, *Gulmat* in Hunza district;
- Astore, Thore, Zian, Chongra in Diamer district.
- Arund, Mehndi in Skardu district.

Agha Khan Rural Support Programme (AKRSP) is operational in Sultanabad, Jaglot, Karimabad, Gulmit, and Gulmat. Due to the project's interventions, basic facilities of health and education are available in these villages. Rest of the villages face problems of accessibility, lack of marketing facilities, health and education facilities, unsustainable forest utilisation and other similar problems. Family size is too large. In Hunza, literacy rate is quite high while in the rest of the area literacy rate is not so good. There are no market committees or other bodies for market promotion of local produce. There are no provisions of cold storage, or processing units even in the district headquarters.

7. Field report evaluation

The people were critical of the ineffective role of the government in marketing their fruits and vegetables

During discussions with the communities, it was observed that most of the people were ignorant of the emerging threats of trade liberalisation. Even a large number of government officials and development workers did not know anything about the WTO. The people were critical of the ineffective role of the government in marketing their fruits and vegetables. They complained that they had never been consulted and unilateral decisions were imposed on them. Some of the respondents were aware that the area abounds in biological resources. However, they were not able to understand the TRIPS Agreement and patenting regime.

SDPI also took various interviews and group discussions with concerned government authorities, academia, development practitioners and other stakeholders. The main observations were:

- a. Most of the government officials and development practitioners were ignorant of the WTO and its impacts. A few were aware, only to the extent, that the WTO has been established. One of the government officials from agriculture department mentioned that he was aware of the WTO but does not know about its objectives and how does it work.
- b. Fruits, *salajit* and medicinal plants were important products of the area from the point of view of exports. One of the development workers apparently said that a Turkish firm is marketing apricots under the trade name of "Hunza Apricots". This proves that products of this area have export potential but there is a need for a serious effort to explore this potential. Furthermore, gold mines are located in the Shimshal valley. The *salajit*, a mineral compound is smuggled throughout the world from the valley. Another potential product, which has a greater demand in the market, is embroidery work carried out by the women of the area.
- c. The consensus was that there is no facilitation from any government department in marketing their produce. The markets are located in big cities of the area. Due to lack of infrastructure, they have to sell their products to the intermediaries in the smaller

Due to lack of infrastructure, farmers have to sell their products to the intermediaries in the smaller markets

markets where they do not get fair price for their produce. In some areas, AKRSP has started its marketing programme to benefit the communities thus saving them from intermediaries.

- d. Those who were complaining of under pricing were of the view that due to higher supply in harvesting season, the demand reduces and lack of storage facilities force them to sell the produce at a much lower rate. To them, absence of grading and packaging facilities is another factor for low prices. Some respondents informed that in the absence of government subsidies on inputs they have to buy seeds and fertilisers on credit. Hence after harvesting, they cannot wait for price stability and to pay off the loan they sell at whatever price is offered to them.
- e. The common demand was that the government should construct link roads, provide storage facilities and employment-generating activities in the area. They also thought that the people of the area are more poverty-stricken and should be offered some assistance in production and marketing of their products.
- f. People from various localities came up with a number of plants, which they were using for curing malaria, pneumonia, cough and cold. The most important plant they mentioned was Kurth (*Saassuria lappa*) [which, as mentioned above, is prohibited for commercial exploitation under the CITES]. It is however available only in far off valleys now.
- g. Most of the NGOs are providing loans to the farmers, but interest rate is too high. Some government agencies also provide credit facilities to the farmers but only the large farmers are deriving the benefits.

Most of the NGOs are providing loans to the farmers, but interest rate is too high

8. Recommendations

- a. To ensure that multilateral trade rules promote the right to food and support development goals in the LDAs, AoA and TRIPS should be renegotiated to ensure food security, livelihood security, poverty alleviation, and equitable development in fragile areas.
- b. The TRIPS Agreement should be made consistent with the Convention of Biodiversity (CBD) and patents on the seeds of food crops should not be allowed to MNCs.
- c. During the negotiations on AoA, the government of Pakistan should propose a clause in the “Development Box” that would benefit the developing countries and the LDCs and also bind governments to offer special and differential treatment (S&DT) to the people living in the mountain areas to protect their livelihoods.
- d. There must be a provision of domestic and export subsidies to agriculture in the mountain areas. Immediate implementation of the existing tariff reduction commitments by the developed countries is a must to ensure greater market access for the products from the mountain areas.
- e. Pakistan along with other HKH countries must lobby for a duty free access for all products originating from the mountain areas of under-developed countries without any quantitative restrictions (QRs). Besides, measures should be taken to enhance export competitiveness of the products of such areas by providing them with technical and financial assistance. For better S&DT, these countries must demand that the LDAs of the HKH region should be offered this treatment not less than that for LDCs.

CHAPTER VI

SUSTAINABLE FARMING PRACTICES IN PEAK WILDERNESS AREA

1. Introduction

Sri Lanka became accustomed to importing rice from other countries, as it could not even produce the quantity needed to feed its own people

Farmers are respected in Sri Lankan society as farming profession has always been at the top in this agro-based economy. Even ancient kings gave special importance to farming. They had constructed dams and introduced irrigation systems so that precious rainwater could be stored, saved and reused in times of drought. However, the colonial masters, who dominated Sri Lanka from the seventeenth to the early part of the twentieth centuries, were more interested in cultivating commercially viable crops such as cinnamon, rubber and tea. They did not give state patronage to traditional farming that later came to a virtual standstill. Dams and reservoirs fell into disrepair, and there was insufficient water. Gradually, Sri Lanka became accustomed to importing rice from other countries, as it could not even produce the quantity needed to feed its own people.

The Sri Lankan farmers traditionally grew rice and cultivated vegetable and tea. Rice farming is done mostly in the north-western part of the country, where hot and wet climatic conditions suit the crop. Rice is also grown using the step method in the hilly areas. This method involves cutting the hillside to form steps on which rice crop is cultivated. However, this is only niche cultivation, and does not cover a large area of land.

The problems faced by overpopulation (resulting in fragmentation of land), environmental pollution (problems in accessing pure water and good soil), and bio-technical issues (the inability to access good varieties of seeds) have put immense pressure on the farmers.

There are many similarities among the farming communities of the South Asia region. However, the some farming practices adopted by Sri Lankan farmers and other farmers living in South Asia do not match due to altitude difference. The highest mountains in Sri Lanka do not match even to the smallest hills in the Hindu-Kush Himalaya (HKH) region. While keeping the altitude-specific hardships of the farmers of the HKH region in mind, one would agree that all farmers in South Asia have been facing the challenges of liberalisation, globalisation, market penetration and access, intellectual property rights (IPRs) and biopiracy related issues.

The evolution of the Sri Lankan farmers in the face of increased concern for fragile ecosystems is a cause of concern

Though Sri Lanka does not have a high concentration of farmers in the mountains, as compared to the farmers in the HKH region, the evolution of the Sri Lankan farmers in the face of increased concern for fragile ecosystems is a cause of concern.

The present study assumed great significance, as one of its objectives is to find out how the traditional role of the farmers has evolved into what it is today, in the light of the factors mentioned above. The farmers' right to livelihood and a decent standard of lives, within the framework of sustainable development, is the focus of the study.

2. Formulation of the research topic

In formulating the topic for the research study, Law & Society Trust (LST) sought to reflect the concerns of the overall project, with its focus on biodiversity issues, farming communities and mountain areas. In the diagnostic phase, the most important activity was the selection of the site for the study. A literature survey was conducted to collect the information for the site selection. Several academics and activists were interviewed to ascertain their views on the site selection. All the interviewees were unanimous in their selection of the Peak Wilderness.

3. Criteria and justification of site

The main criterion that was considered in the site selection was the fragile ecosystem, which is severely threatened

The main criterion that was considered in this regard was the fragile ecosystem, which is severely threatened. However, once the broader area was identified, it was important to select a specific site within that area. Ratnapura division was selected for being in a close proximity to the mountain range. It is where the importance of managing the balance of the ecosystem would be felt the greatest, as any farming activity done here would impact more heavily on the mountain range and its ecosystem than in other areas.

In selecting the site, the Trust bore in mind the fact that the overall regional alliance had focused on the rights of farmers in the context of their vulnerability in terms of a host of concerns, ranging from trade and finance to environment. There is no dense farming population in the mountains, and 100 percent dependency on the forest is no longer prevalent. Since the farmers on the mountain fringes continue to forge deeper into the forest for farming purposes, there is a need to preserve the rich and sensitive mountain biodiversity. Hence, the site was selected according to the following criteria and justifications:

- a. The site that was selected is rich in biodiversity. It is on the fringe of one of the protected mountain areas.
- b. Majority of the households in the area comprised low to middle class families who are landless.
- c. The farmers in the area are dependent on tea cultivation for their livelihood. Each household cultivates an area of 0.25 to 2 acres. However, the people are not aware of how to manure the plantation to achieve optimum yields (which is in the region of 800-900 kg. per acre). They thereby use adulterated fertiliser, which is capable of yielding only 300-500 kg. per acre.
- d. Families in these villages are fairly dependent on the forests for fuel wood, timber, medicinal herbs, honey, yams and leaves. However, stringent forest conservation laws have greatly reduced this dependency and caused the farmers to adopt a lifestyle that is more market-oriented.
- e. For expanded tea cultivation, forest lands are encroached. Titles to these lands are obtained either by prescription or through land titling schemes introduced by the government (*Swarnabhoomi Land Titling Scheme, introduced in 1982*).
- f. The area is (adequately) accessible for study and is remote within the context of Sri Lanka.
- g. The area chosen consists of vertical hills in certain places. These too have been cleared for tea cultivation. Since tea does not have any undergrowth, the possibility of soil erosion is very high. In any

For expanded tea cultivation, forest lands are encroached. Titles to these lands are obtained either by prescription or through land titling schemes introduced by the government

The farmers need to be educated on ways and means of making their livelihood sustainable

case, this area is prone to soil erosion caused by frequent landslides. It is feared that such unplanned tea cultivation will aggravate the problem of soil erosion even further. In the long run, this will lead to poor soil quality, which will in turn affect the yields, and result in lower incomes and a poorer quality of life.

- h. Farmers will have to be educated on how to preserve the fragile ecosystems, and to avoid forest encroachment. The temptation to encroach exists, due to the high income that tea cultivation provides.
- i. There are many laws that prohibit encroachment over forest, road, and river reservations. However, people do encroach these areas, either due to disregard for, or ignorance of, the laws. Hence, they will have to be educated on the laws, so that they may adopt a sustainable means of livelihood while adhering to the legal framework, thereby minimising the adverse impacts on the environment.
- j. The farmers lack the financial know-how required to invest their money wisely. Hence, they will also have to be educated on how to invest and save intelligently, so that their lives would be more secure.

4. Profile of the site

The Adam's Peak mountain range lies between latitudes 6.45 and 6.57 north and longitudes 80.27 and 80.50 east. It is the matrix of four major rivers, which flow to the east, and southwest coasts of the country. It is therefore vital that this Wilderness be protected as it forms the upper catchments of these rivers. The Peak Wilderness is also one of the most valuable conservation areas in Sri Lanka, with the highest number of endemics, notably, birds, reptiles and amphibians. Encroachment over extraction of timber and non-timber forest products (NTFPs) and gemstone mining are regarded as the problems facing this area. This is aggravated by the lack of clear boundaries in severe terrain, while visit of pilgrims has a strong local impact along the main access trails (*It is estimated that about 2 million pilgrims visit the area annually*). The area, being tropical, experiences a high temperature but there are variations according to elevation and location.

5. Research methodology

The research was conducted primarily through collection of data and interviews. An information dissemination workshop was also organised to build the capacity of local officials on farmers' rights issues.

5.1 Data collection

The data relating to population, livelihood strategies, nutrition and other social indicators was collected from the district secretariat Ratnapura

The data relating to population, livelihood strategies, nutrition and other social indicators was collected from the district secretariat Ratnapura. These indicators reflected that the farmers are of middle to high level income earning capacity. In this respect, the tea farmers differ from that of paddy farmers of other districts, as the paddy farmers are low to middle income earners. The farmers in Ratnapura previously used to grow paddy. But with the decline in the demand for paddy in the market, they started growing tea instead. Tea has always fetched high prices and has a much more stable market than paddy.

The Tea Small Holdings Authority (TSHA) is another major resource base from where LST team got a better profile of tea farmers. According to the Regional Manager, there were at least 250 societies under the aegis of the TSHA, which tried to reach out to the farmers and give them some support and help. These are known as “Tea Shakthi”. However, there are still many farmers who have not availed these benefits. The Authority also provided some other helpful statistical data on the farmers.

5.2 Interviews

Tea farming has a relatively short history in this area, and more comprehensive methods of farming need to be developed to maintain sustainability

Interviews were conducted with officials of the district secretariat, TSHA, and the Agriculture Department in Ratnapura. Information gathered from these interviews revealed that tea farming has a relatively short history in this area, and more comprehensive methods of farming need to be developed to maintain sustainability. The research team was also told that the farmers have a little idea to achieve optimum yields.

Interviews with the health officers at the district secretariat and the health department of Ratnapura revealed different concerns. They were primarily concerned about the health and nutrition standards of the region's children due to the fact that the women also work on tea farms. The women work as hard or even harder than the men, as they feel that financial security is important for their children to have a good future. But this focus on job has unintended consequences. They do not have enough time to prepare healthy meals as they are in the fields from morning till evening. As a result, the health department fears that in twenty or thirty years time, the overall health standards in the region will decline.

5.3 Dissemination strategy

It was decided to educate the Grama Niladharis first because they were the closest contact the farmers would ever have with any kind of government authority

For dissemination of information, it was decided to first approach the area through official means, as that is the best way to achieve the desired results. Based on the links that had already been established with the district secretariat, the research team got access to Grama Niladharis³ of the chosen areas. There were 54 people in all. It was decided to educate them first, as they were the closest contact the farmers would ever have with any kind of government authority. The strategy focused on imparting knowledge at a conceptual level, and also focusing on particular areas of interest, using a workshop model.

5.4 Dissemination workshop

Tea farmers are encroaching the forest area, protected under the Fauna and Flora Protection Ordinance

Based on field research conducted in Ratnapura, a two-day resident workshop on farmers' rights was conducted in Ratnapura on 20-21 December 2002. The workshop was held in the Pussella Training Centre, and the target group was the Grama Niladharis of the Ratnapura district.

This workshop provided in-depth information on farmers' rights issues in the context of this project. And the participants were urged to further educate village communities on the results of the workshop. The concept of sustainable development, and its connection to farmers' rights also came under discussion. This is particularly important in Ratnapura, where tea farmers are encroaching the forest area, protected under the Fauna and Flora Protection Ordinance. The ultimate outcome of unsustainable development is detrimental to the farmers. The deforestation in the mountain areas causes the hillside to be exposed to the elements, and to

be washed away when the rains come. It reduces fertility of the soil, leading to poorer crops and a decrease in income. The Grama Niladharis found the workshop extremely useful, as many of them did not know the implications of the laws and did not have the capacity to clarify the position to the villagers.

In Sri Lanka, there are many laws relating to land and its use. The Land Use Laws are of particular relevance as many farmers do not own their own lands, but farm on land belonging to other private parties or the state. It is important to know what status accrues to these farmers, as they are in danger of being dispossessed from those lands at any time. A resource person drew attention of the participants towards a recent amendment in the law, which has abolished the tenant farmers. Though no alternative status has been found in this regard, now the farmers would have to get into a lease arrangement with the landowners. With regard to the state land, farming activities can be done after obtaining a licence. But in actual practice, farmers begin their farming activities (as they have to make use of the good weather) and then seek licence from the state.

It was identified that the farmers are not financially worse off but they have very poor nutrition habits. The main reason is that the entire family gets involved in the farming activity, and the meals that are prepared are often hurriedly done, and consist of just rice and lentil soup. Hence, children are not able to eat green leaves or other nutritious vegetables as these take too much time to prepare, and unfortunately, the mothers remain busy in farming.

The entire village community has to make a concerted effort to ensure that farmers' rights are not swamped by the surge of unsustainable development that is taking place

The concept of productivity was explained to the participants. It could be achieved in very simple ways, and that with good planning, one can increase productivity in all aspects of life. The participants were able to appreciate the fact that the issue of farmers' rights encompasses a wide range of concerns, and that the entire village community has to make a concerted effort to ensure that these rights are not swamped by the surge of unsustainable development that is taking place.

6. Findings

The key findings of the research are as follows:

Though the income is high, saving is virtually non-existent; farmers know neither to save nor invest, thereby causing concerns for the future

- a. Some of the farmers do not own land and they have to farm on the state land under the license from the state. Others indulge in an illegal practice of encroaching mountain areas, thereby threatening fragile ecosystems as well as destroying valuable species. They face the risk of being forced out of the land and forego the reward for the farming activities they had already carried out.
- b. The farmers, especially the women farmers, and their families are at high risk of health hazards, which need to be addressed promptly.
- c. Though the income is high, saving is virtually non-existent. Farmers know neither to save nor invest, thereby causing concerns for the future.
- d. Productivity is also a concern. The farmers are not able to increase their productivity if they do not have access to the latest methods and know-how.

7. Recommendations

If at anytime, tea fails to become a lucrative crop for growing, the farmers should have the option of going back to their traditional crops such as vegetables

- a. The practice of tea growing in this area will have to be monitored and nurtured carefully, so that it becomes sustainable in the long-term.
- b. The land issue will have to be addressed, as the demand for land will increase, while there is already a problem with land supply.
- c. The increase in private sector activities and influence will have to be monitored.
- d. More education and awareness building remain to be done with these farmers to make them aware of the linkages that exist, and the support groups they can reach out to, in times of hardship.
- e. The growing dependency on particular types of chemicals used in tea farming is a cause of concern.
- f. If at anytime, tea fails to become a lucrative crop for growing, the farmers should have the option of going back to their traditional crops such as vegetables. However, at the moment, this prospect appears to be quite bleak. This issue also needs to be given a serious thought.

The future of tea growers in this area appears to be commercially quite stable. However, this will depend, to a large extent, on the support groups and other linkages that are in place to advise and monitor them. Research and development into the best types of tea that can be grown in this part will also have to be strengthened. As a farmer settles into his/her new style of life, his/her other life patterns will also change. Accordingly, there will have to be some support, both social and educational, that will help him/her to bridge this gap.

Endnotes

¹ During the workshop on Mountain Communities and Farmers' Rights: Where We Stand?", organised by CUTS, SAWTEE and RULEK, 23-24 March 2002, Deharadun, India.

² Based on this research, SDPI has already produced two policy briefs: 1) Impact of AoA on People Living in the HKH region of Pakistan; and 2) Impact of the TRIPS Agreement on People Living in the HKH region of Pakistan. Similarly, a working paper, "Agreement on Agriculture (AOA): Impact on Food Security of People Living in the HKH Region of Pakistan" has also been prepared based on the research findings.

³ The Grama Niladhari is a local village officer who operates in the smallest geographical division in his/her administrative capacity as a government officer. Hence, the Grama Niladhari is the government representative closest to the people. Because of this, it was felt that it would be useful to educate them on farmers' rights so that they can in turn empower the farmers in their areas. Grama Niladhari is also a person to whom the villagers turn for advice and help. In this context, educating the Grama Niladhari is akin to educating the entire village.