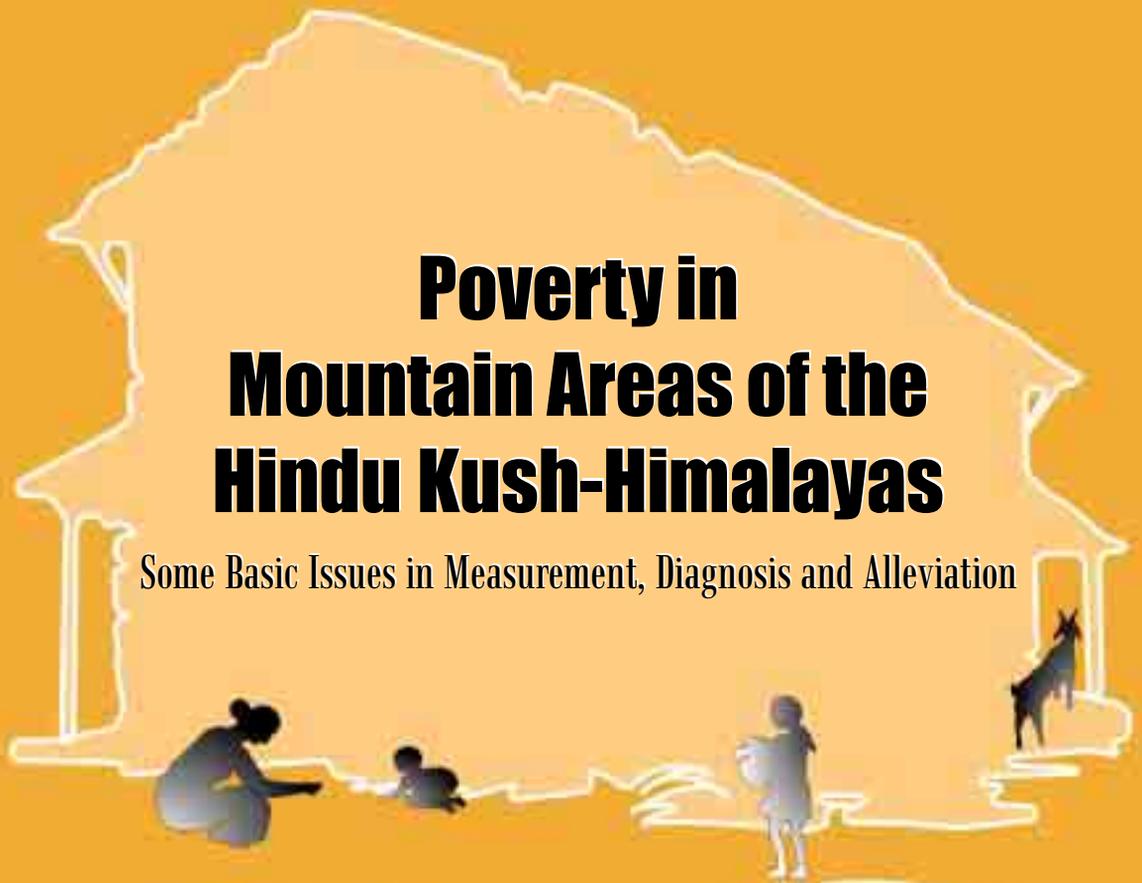


Poverty in Mountain Areas of the Hindu Kush-Himalayas

Some Basic Issues in Measurement, Diagnosis and Alleviation



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Poverty in Mountain Areas of the Hindu Kush-Himalayas

Some Basic Issues in Measurement, Diagnosis and Alleviation

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Infrastructure Division

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preface

Mountain areas of the Hindu Kush-Himalayan (HKH) region generally not only have a relatively high proportion of people living in poverty, the forms and sources of their poverty also differ from those commonly seen in the plains. This difference arises primarily from the distinctive physical conditions of mountain areas and the socio-economic circumstances conditioned by them. Recognition of specificities of the situation in mountain areas is often lacking in the analyses and policies relating to poverty and its alleviation.

ICIMOD, with its mandate for improving livelihoods and environment in mountain areas of this region, has been engaged in developing approaches, strategies, and programmes suitable for mountain areas in sectors such as farming, forestry, water, energy, enterprises, and tourism. Poverty alleviation has been an explicit or implicit objective of these activities. It has, however, been suggested by different observers, the latest of them being the Quinquennial Review (2001) team, that it would be useful for ICIMOD to evolve a conceptual framework to relate the ongoing and future activities of the Centre with this objective and to help prioritise its programmes.

The present paper is an attempt to address the above two concerns. It basically provides a conceptual background to the nature and sources of poverty and presents elements of a strategy to approach poverty analysis and alleviation in mountain areas of the HKH region. It is hoped that the paper will encourage discussion with a view to improving understanding of causes of poverty and evolving more appropriate strategies and policies to address it. It should also help ICIMOD develop a framework for a focussed and well-prioritised programme of work on poverty alleviation in mountain areas.

Several colleagues at ICIMOD have contributed to developing this paper, especially through their comments on an earlier draft that was discussed in an internal meeting. Suggestions from Dr. J. Gabriel Campbell, Dr. Binayak Bhadra, Dr. N.S. Jodha, Ms. Greta Rana and Dr. Pradeep Tulachan have been particularly helpful in clarifying some of the issues and in incorporating some others. I am grateful to all of them. Responsibility for opinions expressed and shortcomings in the paper are, of course, mine.

T.S. Papola

abstract

An attempt is made in this paper to examine the prevalent concepts, measurement methods of, and approaches to alleviation of poverty in the specific context of mountain areas of the Hindu Kush-Himalayan Region. On that basis, it points out certain specificities of poverty and its sources and outlines the basic elements of a framework for analysis and alleviation of poverty in mountain areas. The paper is organised into five sections (i) Manifestations of Poverty in Mountain Areas; (ii) Sources of Poverty; (iii) Poverty-Natural Resource Degradation Linkage; (iv) Common Strategies and Interventions; and (v) Towards a Framework for Poverty Alleviation, with a focus on the distinctiveness of the dimensions of poverty in mountain areas.

acronyms & abbreviations

DFID	Department for International Development
GDP	gross domestic product
GIS	geographic information system
HKH	Hindu Kush-Himalayas
HMG	His Majesty's Government
INRs	Indian Rupees
IFAD	International Fund for Agricultural Development
NPC	National Planning Commission
NWFP	North West Frontier Province
WB	World Bank
WCED	World Commission on Environment and Development
WFP	World Food Programme
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund

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One overview

Poverty refers to a state of absolute or relative lack of fulfillment of basic human needs in the contemporary context. Attempts to portray and measure it and identify its sources among population groups have been continuously pursued, especially over the last four decades, with the realisation that economic growth and development, even at a rapid pace, often leaves certain groups of the population in relatively poor living conditions. Based on analysis of the nature and sources of poverty, measures to make growth more equitable or focused on the poor, and/or special programmes for poorer groups have been devised by national governments, non-government development organisations, and international organisations and donors. These have met with varying degrees of success. Evaluations and analyses of successes and failures have also been continuously undertaken and changes in approaches, programmes, and interventions have taken place. One of the important lessons from these experiences, often not fully recognised while introducing interventions, is that although in most cases the extent of poverty and its sources and, therefore, the nature and magnitude of required interventions may vary over space and time quantitatively, there are situations in which the manifestations and sources of poverty are qualitatively different, warranting special kinds of approaches and interventions.

In mountain areas conventional methods of portrayal, measurement, and diagnosis are not able to capture the distinctive nature and causes of poverty; hence, realistic assessment of poverty has not taken place. Approaches to poverty alleviation based on assessment using these methods, therefore, are found ineffective. The basic reasons for this are found in the geo-physical features and the social and economic formations conditioned by them in these areas. Specific characteristics of mountain areas conditioning the lives and development of the people are schematically described in what has come to be known as the 'mountain perspective' and consist of inaccessibility, fragility and marginality as constraints on development; and diversity, niche' and adaptation mechanisms as windows for development opportunities (see Jodha 1997 and 2000). These specific characteristics, combined with the 'isolated enclave' nature of mountain economies and societies lead to different manifestations of poverty from those obtaining in non-mountain areas. Lack of recognition and understanding of the implications of mountain specificities often leads to myths and misconceptions about the status of the socioeconomic conditions of the people and also misdirects the diagnosis of the sources of poverty. As a result the strategies and interventions for development and poverty alleviation tend to be either unsuitable or partial, resulting in ineffectiveness and distortion. An attempt is made in the present paper to examine and illustrate the different manifestations of poverty,

how its sources differ and why common strategies and interventions are inadequate; and, on that basis, to identify the basic elements of a framework for approaching poverty alleviation in the context of the mountain areas of the Hindu Kush-Himalayan Region.

It should be clarified at the outset that the Hindu Kush-Himalayan region, extending over 3,500 km from east to west, covering an area of about 35,66,000 sq.km and with an estimated population of 140 million contains not only a wide variety of eco-systems, but also falls into eight countries - Afghanistan, Pakistan, India, China, Nepal, Bhutan, Bangladesh and Myanmar – with varying levels of socioeconomic development among and within them. And there are significant differences in accessibility, economic development and institutional structures not only among the areas falling in different countries, but quite often in different parts of the mountain regions within a country. As a result generalisations on the forms, extent and causes of poverty are always risky. Yet, since characteristics such as inaccessibility, fragility, marginality, diversity and niche¹ are common to all areas to a greater or lesser degree, the observations made in this paper, based on the framework of these mountain specificities as they are, would be, by and large, valid for the majority of areas in the HKH region. At the same time, differences in the levels of development and poverty as they occur currently in different mountain areas of the HKH region are recognised and used for drawing inferences about the poverty generating and poverty alleviating forces in mountain areas.

two manifestations of poverty

Common Measures of Poverty

Poverty is a multidimensional concept. It encompasses both the prevailing welfare levels and capabilities (IFAD 2001). Most often it is measured and portrayed in terms of the indicators of current levels of welfare, disregarding the capabilities of the population to sustain and enhance it. As will become clear from the subsequent discussion, this approach to poverty has serious limitations in mountain areas. Levels of welfare are also mostly seen in terms of some economic indicator - income or consumption. Non-economic aspects of welfare and poverty are not necessarily ignored, but it is assumed that those poor in income and consumption terms are poor in other aspects as well, or those able to meet some objectively determined minimum level of consumption expenditure are also able to enjoy other social and political aspects of a decent living. These assumptions are not always valid. Improved income and consumption may be accompanied by higher dependency and lower freedom while a great sense of empowerment and mobility could be had even at low income levels (Jodha 1988). Yet, economic indicators of poverty, specifically private consumption below an objective 'poverty line', have continued to be the most commonly used measures for analysis and policy. The simplest application of the summary economic statistic in this respect has been the 'dollar poverty' concept used by the World Bank to consider all those as poor who have less than one US dollar per day expenditure in constant purchasing power of 1993.

There have been attempts to both sharpen the scalar concept of poverty by going beyond a single income or expenditure indicator or headcount ratio to assess the poverty gap and severity of poverty (WB 1999) and to include socio-political dimensions by the multi-dimensional index of poverty such as the human development index (*a la* UNDP) for different countries and regions or by bringing in aspects like vulnerability, deprivation, lack of freedom and empowerment, and exclusion (Heninger 1999) in the analysis of poverty. Vulnerability defined as the lack of people's capacity to withstand shock (DFID 2000) is considered a basic feature of poverty. So is the lack of autonomy, referring to the capacity to decide and act for oneself and lack of entitlement making people incapable of claiming their customary and legal rights (Harris et al. 1992; Sen 1999). In its latest exposition on poverty, the World Bank views poverty to pertain to the lack of four attributes: opportunity, empowerment, security and capabilities (World Bank 2000). Data on these aspects are often 'soft' and only qualitative, but their incorporation into the understanding of poverty is important, particularly in the case of marginalised mountain people.

Several development and donor organisations have attempted to approach poverty from different dimensions with a view to developing a framework for poverty alleviation according to their own jurisdiction and work orientation. According to the United Nations Development Programme (UNDP) people are considered poor when they cannot secure a minimum standard of well-being and when their choices and opportunities for a tolerable life are limited or restricted (UNDP 1997). The World Bank would like to make it more precise in terms of determining a consumption-based poverty line, but recognises that the concept is not sensitive enough to the extent and depth of poverty and would, therefore, like to use measures such as the Poverty Gap (WB 1999). World Food Programme, concerned primarily with ensuring food security for the poor, concentrates on people for whom food supplies are insufficient, implying that they constitute the core of the poor (WFP 2001). The Department for International Development (DFID) of the United Kingdom in its approach to 'sustainable livelihoods' as the basic framework for development and poverty alleviation identifies 'vulnerability' as the key to poverty (DFID 2000).

Each of these and other approaches to defining poverty and identifying the poor are relevant to mountain areas, as is clear from the account of manifestations and sources of poverty in the subsequent sections of this paper, but none of them directly incorporates the specific manifestation of poverty in mountain areas. Limited options for livelihood, food insecurity, and vulnerability are some of the basic features of mountain livelihoods, but their forms and sources are often different from those in other areas. Closest to recognition of the physical location as a correlate and source of poverty is IFAD's operational approach to poverty from different perspectives, such as 'who are the poor?' 'where do the poor live?' 'how do the poor get income and use it?' 'what access do the poor have to assets?' and 'what are the barriers to progress for the poor?' (IFAD 2001), which lists 'high altitude' and 'remote' areas among the ones with high concentrations of poverty.

Poverty is not only a multi-dimensional phenomenon, its manifestations vary across areas and groups of population as well as by levels of development. The poor are mostly identified, in terms of private consumption below an objective 'poverty line', but those considered non-poor in terms of current consumption and income may be poor in terms of capabilities and welfare. Such non-linearities between consumption levels and other aspects of welfare and capabilities are more prominent in mountain areas where variations in access to markets, services, and knowledge can lead to drastically different levels of welfare and capabilities not necessarily reflected in current consumption levels.

Discussions about whether we need separate indicators for poverty and development in mountain areas, or should study them in a comparative framework using common indicators and methodologies, have taken place. The 'mountain perspective' framework argued that mountain areas need a separate frame of analysis because of the specificities that qualitatively distinguish them from the flatlands. On the other hand, there is also a plea to 'apply well established development indicators' such as 'quality of life indicators' in mountain research, even though the 'complex living conditions' and 'great variations' between regions, groups, and households and their members are well recognised (Kreutzmann 2001). This view is contested by others, not so much with the plea that separate indicators are required for mountain areas, but with the argument that 'indicator-driven research', is 'highly aggregated', 'externally imposed' and 'decontextualised'. Emphasis, it is argued, should be not only on building relevant indicators, but also on 'qualitative, informal or cultural contexts' (Rhoades 2001). A more meaningful approach to research into development and poverty in mountain areas lies in, first, examining how common indicators suit the specific conditions in these areas and what modifications are

needed to reflect specificities of location and, then, to identify what additional phenomena and processes need to be examined to account for mountain specificities. Accordingly, an attempt has been made below to examine the appropriateness of conventional economic measures of poverty for portraying economic poverty and to indicate non-economic correlates of poverty as they specifically occur in mountain areas.

Economic Indicators of Poverty: Limitations of Consumption – Production Based Approach

Commonly applied statistical indicators of poverty do not always reflect poverty or its absence in mountain areas. Mountain conditions, terrain, and climate make it absolutely necessary that people have a higher minimum energy and caloric intake, in their food, for survival than in the plains and that they have minimum clothing, including warm clothing and permanent shelter, to protect themselves from the extremities of weather and climate. Use of common consumption norms to measure the well-being of the people in these aspects, therefore, may place many mountain people above the poverty line even though their basic needs have not been fulfilled. Poverty ratios based on consumption, using a common 'poverty line' are likely to indicate that many people who are not able to meet their basic survival needs according to local conditions are non-poor, and thus the 'incidence of poverty' is shown to be lower in mountain areas than even in relatively better-off regions in the plains. Thus incidence of poverty measured as the proportion of the population below the poverty line based on consumption norms was estimated to be lower (41%) in the hills of Nepal than in the Terai (42%) in 1995-96 (HMG/NPC 1998; Upadhyaya 2000), in the North East Hill region (34%) and Jammu and Kashmir (25%) than in India as a whole (36%) in 1993 (Dubey and Kharpuri 1999; Joshi 2000), and in Balochistan (8%) than in the whole of Pakistan (17%) in 1991 (Zia 2000). If a poverty line taking into account (i) higher energy/calorie intake; (ii) greater non-food needs for clothing and shelter for survival; and (iii) higher prices prevalent in mountain areas is adopted, the incidence of poverty, in terms of population suffering from the inability to meet basic needs, would be much higher (for an illustration, see Annex 1).

It may, however, be noted that, even using conventional measures, incidence of poverty in mountain areas is generally found to be higher than in the plains. In Nepal, mountain areas had 56 per cent of its households below the poverty line in 1955-56, compared to 42 per cent in the country as a whole. In the North West Frontier Province, it was estimated to be 20 per cent compared to 17 per cent for Pakistan as a whole. In India, most hill and mountain States showed a higher percentage of households below poverty line (e.g. Arunachal Pradesh [40%], Meghalaya [38%], Nagaland [48%], Sikkim [41%], Himachal Pradesh [39%], than in the entire country [36%] in 1993.

A more important feature of the consumption levels in mountain areas is that they are not always met by local income generation but by remittances, thus making their sustainability rather precarious. Studies from different areas suggest that an average of about 35 per cent of the consumption needs of mountain households are met through remittances (Khanka 1988; Bora 1996). Income estimates, as they are made, measure the income originating and not income accruing, and, in the case of mountain areas, the latter happens to be much smaller than the former due to the extractive nature of several important income-generating activities (e.g. forests, tourism, hydroelectricity, minerals) from which income is produced in the region, but most of it flows elsewhere. Of the income from forests, for example, local retention is estimated to be only around 10-15 per cent. Per capita domestic product was estimated to be about 25 per cent higher, for example, in the case of Himachal and Uttaranchal than the

national average of India, but these estimates go down by about one-third, once income retained in the respective states only is considered (Papola and Joshi 1985; Papola 2000).

Isolation

A poor productive base, limited absorptive capacity, limited linkages to use local produce to strengthen the local economy in a value-adding chain and unfavourable institutional and market mechanisms leading to accentuation of the phenomenon of unequal exchange with other areas are features that are, more or less, common to most poor areas. What makes the situation in mountain areas qualitatively different is their inaccessibility. Lack of access to markets, technologies, and information is not only a cause of their underdevelopment, but is itself a facet of poverty in terms of isolation and non-participation in wider social, political, and economic processes. Improvements in access through development of transport and communication networks and, in recent years, access to knowledge and information through electronic media, while positive developments, in themselves, have made the physical, social and economic isolation of mountain communities more conspicuous to them and others and have added a new dimension to the perception of poverty in a relative sense. Access to information has raised awareness and aspirations, but, unaccompanied by access to resources and opportunities, it has, at the same time, led to frustration and increased consciousness about their poverty among mountain people.

Insecurity and Vulnerability

A limited resource base, further limited by the constraints on its use due to fragility, is a dominant characteristic of mountain areas. While the population density is lower in these areas than in the lowlands, the actually usable, arable land per person is extremely limited and not very fertile. Food insecurity, because of both limited availability and poor fertility of land and difficulty in delivering food from lowland areas, is a common feature in many mountain areas. Access to other resources, such as forests, is mostly restricted by legal and institutional arrangements. Use of non-crop, non-forest, marginal lands, even where permitted, is not very productive because such land is usually degraded and cultivation is often hazardous due to its fragile nature. Infrastructure such as roads, that constitute 'lifelines' for most mountain people, are often not dependable because of natural hazards and blockades. Fragility and a high incidence of natural hazards make the lives of people insecure and vulnerable and often threaten the very means of survival and livelihood such as agricultural lands, crops, and shelters, besides transport and communication channels. In other words, maintenance of livelihoods, even at current levels, is precarious and danger of relapse into poverty is ever imminent.

Social and Political 'Exclusion'

Mountain areas are often located on the periphery of the geographical landscape of nations. They are inhabited by too few people to be politically important. The total population of the HKH region is estimated to be around six per cent (and the area 23%) of the total of all the eight countries within which the region falls (Banskota 2000). Often, most people in the mountains are also socially secluded because of their tribal origins. As a result they find themselves marginalised with limited or no voice, presence, and involvement in national socioeconomic and political processes. This not only results in the absence of their concerns and issues of development in national agenda, but also develops in them a sense of exclusion and deprivation, which adds another, psychological and emotive, dimension to the poverty of mountain people (Sadeque 2000).

Infrastructure and Services: Provision v/s Physical Access

Isolation because of limited physical access to infrastructural services is a distinct feature of mountain areas arising out of the peculiarities of topography and terrain. This is not often reflected in the indicators of infrastructural development commonly used. Road length per thousand of population or even per square kilometre of area, or schools and health posts per thousand of population do not correctly reflect access to these services, as even a high density of these items may still leave many settlements and population groups far away from them. Indicators that reflect the proportion of population within walkable distance can convey the extent of access better. But even such indicators have limitations because of the terrain to be covered. Similar distance to a motorable road, school or health post, in fact, implies less access in mountain areas than in the plains. A kilometre in the mountains is much 'longer' than in the plains in terms of the time and energy taken to travel!

Geographically Endemic Poverty

A distinct dimension of poverty in mountain areas is that it primarily results from the severity of constraints of an unfavourable geographical situation and only secondarily by the resource endowments of individual households. Thus poverty afflicts the entire population of an area more often than only some households in a generally non-poor area. This is not to deny the differences and inequality among households and groups, but they are less glaring than those between accessible and inaccessible areas, on the one hand, and between the mountains and other areas, on the other. In other words, poverty in the mountains is more area-specific than household-specific. This seems to have been well recognised in the poverty alleviation approach adopted in China where 'poor areas', rather than 'poor people' are identified and targeted for development (Banskota and Sharma 1993).

Physical Stress, Hazards and Risks

Among the most visible manifestations of poverty in mountain areas are the strain and drudgery that people, particularly women, have to undergo to eke out a living. Much of the strain is because of the difficulty in procuring basic needs such as water and fuel and basic inputs like fodder for livestock, which are not always available within easy reach and have to be brought from some distance through difficult and hazardous terrain. Various operations in the main productive activity, namely, agriculture, are also no less strenuous as most of them have to be carried out manually. Long hours of work, drudgery, hazards and physical strain are not only results but, in fact, are special dimensions of poverty in mountain areas that are not reflected in any of the conventional indicators.

Wastage of Human Resources

A paradoxical situation is often visible in many mountain areas: in the midst of long hours of back-breaking work and year-round drudgery in household and productive activities, specially among women, there is a lot of idle labour, particularly among men. Studies show that about 45 per cent of person days remain unused, the proportion is much higher at 63 per cent for men than for women at 34 per cent (Bora 1996; Khanka 1988). Women's efforts and energy are mostly spent without commensurate returns, and could be available for more productive and socially useful purposes if technological, economic and institutional solutions were found to reduce the time taken for and drudgery of their work to satisfy basic household needs. Men have little productive work beyond what is 'assigned' to them in the context of so-called gen-

der-based division of labour. Thus most labour is not productively used and is reflected in high incidences of unemployment, underemployment and 'disguised' unemployment, constituting other important aspects of poverty in mountain areas.

Poverty Induced Migration

Lack of productive employment opportunities results in outmigration, mostly of adult males. Mountain areas, as a result, have a much higher incidence of outmigration (estimated to be around 40 per cent among adult males) than areas in the plains, producing multiple impacts on mountain economies and societies. To the extent that migrants send remittances, they help to support their households. Since migrants are mostly males, the sex ratio is 'favourable', particularly in the working population, and there is a higher incidence of women-headed households, sometimes as high as 20 per cent (Acharya 2000). Both these phenomena have concomitant economic and social effects. Although the main occupation, namely, agriculture, does not need all the available workers throughout the year, to the extent that most of them are needed during the short busy seasons, migration results in labour shortages and reduction in agricultural productivity. Thus migration is a multidimensional aspect of poverty in mountain areas; constituting not only a result, but also a cause and manifestation of poverty in itself.

three

sources of poverty

The descriptions of the various facets of poverty in mountain areas suggest that the nature and pattern of livelihoods are primarily shaped by physical characteristics that also condition the socioeconomic situation of people in these areas. Inaccessibility, fragility and marginality in physical terms lead not only to a limited base for sustaining livelihoods but, more importantly, result in a great degree of vulnerability, risks and uncertainty in realising the outcomes of livelihood activities.

Limited Resource Base

It is often said that mountains are rich in resources. The fact, however, is that usable resources are extremely limited. Most mountain households depend on farming as the main source of livelihood, but as only around six per cent of the land area is arable (Banskota 2000), the per capita cultivable land is very limited, even with a very low density of population. Over two-thirds of households, with an average size of five to six persons, own less than one hectare of land each, in Bhutan, the hill states of Central and Western India, the hills and mountains of Nepal and the mountain areas of Pakistan (Tulachan 2001). The average amount of arable land per capita is higher in some parts of North East India and Bhutan, but most of it is very low in productivity as it is used for shifting cultivation. In other areas too, most of the land is on slopes and is not suitable for the modern farming methods applied elsewhere. Most arable land is marginal and fertility poor.

Resources for non-farm activities are also limited and in most cases not under the control of local communities. Also, whatever potentials there are not used because of several constraints. Being inaccessible and isolated, most mountain areas have little exposure to and contact with the commercial world outside. This has forced them to focus on farming for subsistence as getting food from outside is difficult. Rising populations with limited cultivable land have led to insufficient food supplies and insecurity. Opportunities to earn income from non-farm activities to buy food and other items of consumption have been limited by the lack of a resource base and poor infrastructure. Thus, over the years, the livelihoods of most mountain people have become more precarious.

Restricted Access to Natural Resources

Resources in which mountains are described as rich, such as forests, minerals and water, are not always accessible for use by mountain people. Besides the difficulties in physically access-

ing them, they are mostly under the control of external authorities like governments that legally restrict their use by local communities for various, including commercial and environmental, reasons. And when these resources are used, either by governments or the private sector for commercial purposes, most income and revenue flow out of the mountains with minimal retention within the mountain regions themselves.

Lack of Access to Markets, Technologies and Inputs

The limited opportunities for an increase in incomes that exist with whatever access to natural resources is available are constrained by lack of access to markets. Markets are physically distant, information about them is not available and because production is dispersed and on a tiny scale, marketing costs are prohibitive. Production is with traditional techniques, mostly manual because there is no motive energy, resulting in low productivity. The capital base of mountain people is poor and access to credit is limited because of lack of both accessible credit outlets and the technical ineligibility of most mountain households to obtain commercial bank loans. For example, in India, with a strong state-led emphasis on extending banking outlets and services to rural areas and targeted programmes of agricultural credit, per hectare credit by 1997 in mountain areas worked out to be INRs 150 compared to INRs 1,600 in the country as a whole (Chand 2000). In Nepal, of the seven major micro-credit programmes, five had no coverage in mountain districts and limited coverage in hill districts. Only government-run programmes reached all the districts (Dhungana and Thapa 1999). Remittances that many households receive from out-migrants are mostly used to meet the deficit in subsistence level consumption over their own production and income.

Unequal Exchange

The purchasing and investing capacity of mountain people is further weakened by highly unfavourable terms of trade in their transactions with other areas. Most of their purchases are at high prices due to transportation costs and, often, the scarcity situation. They have to sell their produce cheaply due to lack of knowledge and inaccessibility to markets, limited holding capacity because of the dire need for cash to meet subsistence needs and lack of bargaining power due to unorganised, individually based small-scale sales to middlemen. Lack of lateral trade and transport often leads to sale at low prices and purchase at high prices of the same commodities, because only 'vertical' transport and trade channels are available between the mountains and plains, and not among different mountain areas, so goods first flow 'down', and then 'up' for final sale to consumers in the mountains. Inequality in exchange is magnified many times if one considers not only the terms in which goods are traded but also the overall flow of natural and human resources from and to mountain areas.

Weak Institutions

Mountain communities have evolved their own institutions and organisations to regulate the socioeconomic aspects of their lives and to cope with calamities and hazards. These include mechanisms for sharing labour and other household resources; for management of common resources like forests, pastures and water; and for community action to meet natural disasters. They have functioned well in the context of subsistence economies and isolated societies. They are, however, becoming increasingly inadequate in a scarcity ridden and dynamically changing environment exposed to the world at large. In other words, their efficacy in the spheres of development and poverty alleviation is inadequate. For example, tribal councils in many areas have been successfully managing the resources and conflicts of communities, but are not

equipped to deal with the problems of organising production and marketing agricultural or forest-based products. On the other hand, the new institutions and organisations tried by governments and non-government agencies to carry out these tasks have only been partially successful, partly because they are alien to local communities insofar as they have not been built upon the local traditional, institutional and cultural base, but mostly because, as they are often conceived, they are not able to bring about the necessary enthusiasm and commitment of people around common interests and visible or potential benefits.

Neglect of Mountain Specificities by Development Policies

Mainstream development strategies, policies and programmes are often unsuitable for mountain areas either because of inadequate understanding of mountain specificities or because of lack of concern for marginal mountain areas. Dominant development strategies, such as those based on the green revolution and large-scale industrialisation, have little relevance for mountain areas; and no special strategies based on their specific conditions have been evolved and implemented in mountain areas. Sometimes an extreme view is taken to write-off mountain areas as unfit for development and any concerns raised relate solely to environmental conservation. This perspective, focussing only on the constraints of development, fails to recognise and, therefore, tends to ignore the opportunities that mountain areas have in the diversity, comparative advantage and niche of their natural resources and the skills and dexterity that mountain people have developed to adjust to adverse circumstances. And, even when these opportunities, such as in tourism, hydropower, and forest products, are recognised, appropriate and integrated policy and institutional mechanisms are not developed to use them for the benefit of mountain people.

four poverty and natural resource degradation

The link between poverty and natural resource degradation is the central issue in sustainability of livelihoods and the environment in mountain areas. In all efforts to analyse the nature and sources of poverty and to devise poverty alleviation approaches for mountain areas, it is extremely important to understand and appreciate the nature and implications of poverty - environmental resource - development links. For, given the limitations of large-scale creation and use of man-made physical assets and technologies, mountain people primarily depend on natural resources to sustain and improve their standards of living. However, most of these resources are environmentally sensitive and their indiscriminate exploitation poses threats to sustainability not only for the living standards of people in the mountains but also for those of people in lowland areas. The basic issues that need to be investigated and understood in this context are:

- what is the relationship - associative or causative - between poverty and the state of environmental resources?
- does development for poverty alleviation necessarily lead to degradation of natural resources?
- are there economic and technological solutions that lead to enhancement of the welfare of mountain people without degrading environmental resources?
- to what extent can poverty reduction and sustainable resource management be combined with appropriate institutional arrangements? and
- what criteria should be used when a trade off is involved between poverty reduction and conservation of resources?

Relationships between development and environment and between poverty and natural resources have been studied over the past two decades within the framework of what has generally come to be known as 'sustainable development'. The concept, evolved in the Report of the World Commission on Environment and Development, is defined as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED 1987). It implies prudent use of natural resources at a rate that does not exceed their regeneration. Studies assessing the poverty-environment-development linkages have mostly highlighted the conflict between poverty alleviation and environmental resource conservation but have fallen short of arriving at workable solutions. In any case, attempts to examine the linkages between poverty and natural resource degradation in the mountain context, particularly in the poor regions of the Hindu Kush-Himalayan region, have been rather limited. It is, therefore, important that the hypotheses that have been generated on the basis of studies elsewhere are examined closely in this region.

Poverty-Environmental Degradation: Cause and Effect

The first proposition that needs examination relates to poverty as a cause or consequence of degradation of natural resources. Most studies have established an association, but not a causality between the two phenomena (Markandya 2000). In general, a poor community is likely to have a more degraded environment than a non-poor community. Thus deforestation and poverty are found to go together (Jagannathan 1989; Deininger and Mintzen 1996). On the other hand, mapping of development indicators in Nepal showed that the poorest districts have the least natural resource degradation (ICIMOD 1997; Jodha 1998a). None of these or other studies establish causality: neither the earlier two studies in West Java, Indonesia and Nigeria and in the Chiapas and Oaxaca regions of Mexico suggest that the poor were responsible for deforestation; nor do the findings relating to Nepal tell us that the poor conserve their environment better, or forgo opportunities for improving their livelihoods for the sake of environmental conservation.

In general, however, the poor are seen as 'the most visible agents' of destruction in a degraded environment. The poor depend heavily on natural resources, especially in mountain regions, for their livelihoods and their poverty offers them few choices. It is this lack of alternatives that forces them to use available natural resources intensively. The poor seem to 'stand at the end of a long chain of cause and effect' and 'are the messengers of unsustainability rather than its agents' (UNFPA 2001). There is a growing view that the poor are not necessarily the main agents responsible for resource degradation: quite often the rich play a much greater part in this process (Metz 1991; Prakash 1997; Jodha 1998b). Where the poor have encroached upon or over-exploited natural resources, it is not out of preference for providing for their sustenance in this way, their ignorance of its consequences, or for lack of a stake in natural resources, but because they have no other options. Therefore, it is necessary to look at the factors and processes that have led the poor into a situation of 'choicelessness' and evolve strategies to increase their livelihood options.

Irrespective of whether the poor or the non-poor are mainly responsible for environmental degradation, it is widely agreed that the poorest sections of the society are hurt most by a declining natural environment. For, the poor and the vulnerable are most often users of marginal resources and also the most dependent on common property resources (Dasgupta 1996). Fuelwood scarcity imposes greater hardship on the poor, particularly women, than on the better-off (Kumar and Hotchkiss 1988) and when water shortages occur as a result of deforestation and misuse of natural resources, the poor are most affected (Kadekodi 1995). On the other hand, it is also observed that environmental regulations that increase the cost of production of certain goods result in increased unemployment and higher prices producing differential impact on the poor and the non-poor groups.

Population-Environment Links

Among the factors that have led to over use of natural resources by the poor, pressure of increasing population is considered to be the most important (De Janvry and Gracia 1988; Cleaver and Schreiber 1994; Dasgupta 1996; Lopez 1997). There is limited evidence in favour of the 'Boserup hypothesis' (Boserup 1965) postulating improvement in resources, particularly land-based, and increasing resource productivity with increase in population pressure, but most empirical evidence suggests that areas with an increase in population density beyond 'carrying capacity' are also areas of the greatest degradation. At the same time, it is pointed out that with right policies increase in population need not result in environmental degradation

(Heath and Binswanger 1996). A poverty-resource degradation linkage is found to work through population pressure in the following sequence: as the natural resource base is increasingly degraded, poor families require more members to achieve the same level of welfare and with increasing fertility and population the cycle of increasing degradation is established (Dasgupta 1995). In mountain areas, another dimension of population dynamics that needs to be considered is that of high incidence of outmigration of the working population, especially men. Although this could, on the one hand, help to check environmental degradation to the extent that it reduces pressure on natural resources, it could, on the other hand, result in weakened families compelled to adopt short-cuts to natural resource use and less labour allocation for conservation-oriented practices (Collins 1987).

Resource Management Systems: Is Community Participation the Solution?

It is widely recognised that the key to the poverty-environment relationship is the question of natural resource management systems. It has been argued that the traditional community systems of natural resource management have a great deal to offer in the evolution of institutional arrangements for sustainable management of natural resources and their use for the benefits of local people (Berkes 1989; Jodha 1998a, 1998b). Several cases have been documented about how community, rather than state or private, control and management has succeeded in ensuring sustainable use and regeneration of natural resources. Notable examples are those of the land, water and forest resources in Western India (Chopra and Kadakodi 1988; Chopra and Gulati 1996; Narain 1998) and of participatory forest management arrangements, especially community forestry in Nepal (Bhatia 2000; UNFPA 2001).

Economic Growth, Environment and Globalisation

An interesting aspect of the poverty-environment-development interrelationship consists of the long-term relationship between income levels and quality of environment. As pointed out by Markandya (2001), some studies suggest a U-shaped relationship between GDP and environment, i.e. the quality of environment deteriorates initially as GDP per capita increases, and then improves after a threshold level of the per capita GDP is achieved (Grossman and Krueger 1991; World Bank 1992; Barbier 1997). (The relationship is also referred to as 'Environmental Kuznets Curve', alluding to the economic growth-income distribution relationship postulated by Simon Kuznets.) Evidence has also been found favouring an 'inverse U-shaped' relationship (Stern and Barbier 1996) suggesting a positive relationship between GDP and environment initially and a decline in quality of environment after a critical level of per capita GDP is achieved. In either case, however, there appears to be inevitable degradation of the environment, sooner or later, and it could be of an irreversible nature. It is, therefore, important to build in mechanisms to check environmental degradation into the strategies for development and poverty alleviation. In the particular case of mountain areas, the nature and sequence of relationships between income enhancement efforts and natural resource degradation need to be studied at the level of micro-ecological regions and locations to devise such mechanisms.

It seems clear that communities in mountain areas will continue to depend heavily on agriculture and other natural resource-based activities for their livelihoods. Environmental degradation will only deepen their poverty. So environmental conservation and poverty alleviation need to be the parallel objectives of any intervention in mountain areas. In this context the impact of on-going processes of globalisation on mountain communities and environment needs to be closely examined. It is feared that globalisation can, on the one hand, marginalise the nature-based niche of mountain areas, and, on the other, be quite insensitive to their fragile ecosystems.

tems (Jodha 2000). In general, globalisation is seen to have increased overall prosperity and stimulated growth, but, at the same time, it has increased income inequality and environmental degradation (UNFPA 2001). In pursuing economic reforms to benefit from globalisation, policy-makers have often ignored the parallel social, environmental, and institutional reforms required to prevent increases in inequality, poverty, and environmental degradation (Reed and Rosa 1999).

Economy-Environment Trade-off: Making Choices of Economic Activities

It should be recognised that most development activities, either of a productive nature or for building infrastructure in mountain areas impinge on environment. The environmental impact of different activities varies, as does the economic benefit flowing from them. At one end, there could be 'environmentally benign' activities with high income generating potential (e.g. growing medicinal plants and herbs, planting fruit trees, and so on.) and, at the other end, there are 'ecologically disastrous' ones bringing in large short-term gains mostly to non-local entrepreneurs and contractors, but inflicting irreparable damage to the environment (e.g. extractive activities such as mining and indiscriminate exploitation of forests). The latter need to be, no doubt, severely restricted; but confining economic activities to the former only will leave mountain people with very limited options for their livelihoods. Between the two extreme types of activities - 'environmentally benign' and 'ecologically disastrous' ones, there is a whole range of activities with varying degrees of environmental impact and economic benefits. Each of them entails a 'trade-off' and effort needs to be focussed on selection of a pattern of activities that minimises environmental impact and maximises economic benefits. The exact measurement of the impact of each activity in quantitative terms is not always possible, especially as environmental impacts are not easily quantifiable. It should, however, be possible to rank activities by their environmental impacts and economic benefits (as illustrated in Annex 2) and use such a ranking for decision-making and policy formulation with a view to promoting a structure of economic activities that maximises benefits to the people and minimises environmental degradation.

Green Technologies and Alternative Energy: A 'Win-Win' Strategy?

It appears that there is more often a conflict than a concordance between poverty alleviation and environmental conservation. In most cases, a trade-off between conservation and poverty alleviation looks inevitable, and this poses a major challenge to policy- and decision- makers. It is agreed that only an integrated approach to the problems of poverty and environmental degradation can result in sustainable development. Such an approach remains elusive. In a recent document UNFPA has been bold enough to propose a sustainable development strategy, consisting of the following 'building blocks', as 'win-win solutions for poverty and the environment' (UNFPA 2001): (i) increasing the resource base of the poor; (ii) investing in alternative energy services and infrastructure; (iii) support to green technologies; and (iv) pricing policies that do not encourage profligate use of resources such as electricity, water, and fertiliser (UNFPA 2001). The emphasis placed on energy technologies and use seems to be of particular relevance for mountain areas. Energy consumption is positively associated with levels of living and development, but sources of energy - renewable or non-renewable - and efficiency of energy use can make a tremendous difference to sustainability and environment. Mountain areas are generally deficient in access to energy, although most of them have substantial potential for renewable energy generation. Energy sources, technologies and devices of the poor mountain people are inefficient and mostly involve a lot of time, drudgery, and burden, particularly for women.

Escaping poverty is not merely, therefore, a question of finding ways to increase energy consumption, but rather of changing the kind of energy used. Investment in alternative energy services and infrastructure could be among the most effective ways of alleviating the poverty of mountain people.

Most of the above propositions are still in the stage of hypotheses and opinions, as not enough empirical evidence to test them is available as yet. Also most of them are based on experiences and observations from flatland areas. It is important to examine them in the specific context of mountain areas, particularly in the developing mountain areas of the HKH region, with a view to devising strategies and policies for poverty alleviation and sustainable development.

five common strategies and interventions

Approaches, strategies and interventions for poverty alleviation in mountain areas have mostly been in the form of replications and extensions of those developed for and adopted in the mainstream flat land areas. Most of the time the strategies have been sectoral, relying on a lead-sector approach. Identification of the sectors has often not been based on the area-specific approach required for mountain areas, and intersectoral linkages that need to be developed even in sectoral development in the mountain areas, have not been given sufficient recognition. Thus value-addition and marketing emerge only as after-thoughts in agricultural development and diversification programmes. Livelihoods and income generation are seen only as an appendix to forestry sector programmes. Promotion of tourism has not always been linked to local economies and enterprise development is seen basically as a function of small credit. In recent years governments and donors have tried to recognise linkages, though mostly on the basis of experiences in the plains, and develop more comprehensive and integrated programmes. Larger investments in infrastructure and access improvement have become a critical element of development strategies for mountain areas, for example, in China; and sectoral specialisation based on comparative advantage is being tried in some areas in the Himalayan region of India. Donors like the Department for International Development (DFID) have developed a 'holistic' sustainable livelihood approach, emphasising simultaneous development of human, natural, financial, social, and physical capital. The International Fund for Agricultural Development (IFAD) has launched a series of projects especially focusing on 'uplands', relying on a multi-pronged strategy for 'securing livelihoods'. These are recent experiments and their outcomes are yet to be seen.

In most cases, however, the strategies of different programmes have seldom taken cognisance of the specificities of the forms and sources of poverty in mountain areas, as described above. The following paragraphs illustrate how some of the dominant approaches and interventions tried by government planners, non-government development agencies, and donors have proved ineffective in mountain areas.

Infrastructure-led Strategy

Provision of physical infrastructure as a catalyst has been one of the oldest strategies of development. Given that inaccessibility is a major cause of underdevelopment and poverty in mountain areas, access improving infrastructure can obviously be a major facilitating factor in development and poverty alleviation. There are, however, two main problems in solely relying on an infrastructure-led approach in these areas. One, the topography, terrain, and fragility of

mountain areas make development of physical infrastructure like road networks economically expensive and environmentally hazardous. Second, the assumption that infrastructure is not only a necessary but also a sufficient condition of development is not valid in most mountain areas because of a limited, dispersed, and environmentally sensitive resource base and difficulties in the realisation of linkages of infrastructure with the processes of building the production base. As a result, the development of transport networks, unaccompanied by simultaneous efforts to develop the productive potential of connected areas, has often resulted more in a drain of resources, including of human resources, than the benefits to local areas and communities. Access improvement, unless accompanied by the development of human capital, systematic harnessing of niche, and appropriate institutional arrangements for improving the bargaining power of local people may result in greater marginalisation rather than integration of mountain areas in the wider economic space (Bandopadhyaya 1993).

Targeting Poor Households

Identification of the poor and assisting them directly with the provision of productive assets through subsidy and/or credit-based programmes has been a common approach to poverty alleviation. This approach is based on the assumption that poverty is primarily a phenomenon at the household level, and it is mainly caused by the absence of a productive asset base in the case of some households. Once they are enabled to acquire such assets, they will be able to cross the poverty threshold and progressively improve their livelihoods on a sustained basis, as the other conditions for productive use and income realisation, such as access to other inputs, technology, and markets, are in place. In mountain areas, these conditions are generally lacking and, as a result, effective use of the productive assets provided under various government and non-government credit programmes is severely constrained. In any case, provision of credit through targeted programmes is no substitute for investment in social and physical infrastructure (Bennett 1993).

Technology Driven Approaches

Quite often the availability of new technologies has prompted governments, non-government agencies, and manufacturers to introduce programmes based on them to alleviate poverty through more efficient and productive use of resources. Such initiatives assume availability of the extensive resource base as well as access to markets. Input-intensive agriculture and energy-intensive industry are among the successful technology - initiated strategies in the plains. Their suitability for mountain areas is obviously very limited. But even small-scale technologies for improving agricultural productivity, agro-processing, and improved practices for meeting household needs for cooking, heating, and drying are not found suitable because insufficient attention is paid to such specificities as the local resource base, socioeconomic organisation of production, and the capacity and skills to use and maintain technologies and access to markets.

Human Capital Development

Human capital, no doubt, has been found to be a major contributor to development and poverty alleviation. No other approach, either based on physical infrastructure development, capital investment or technology has been found to have sustained success unless accompanied by development of human capital, particularly education, technical skills, enterprise, organisational capabilities, and health. Most mountain areas have a weak human capital base due both to limited access to social infrastructure and lack of exposure to knowledge and experience of

activities that enhance human capital endowment. Efforts to improve the human capital base of mountain people are essential for improvement in their general well being, but by itself it may not lead to alleviation of poverty because of the limited opportunities for its effective use in economically and socially productive activities. In fact, education, a major means of human capital formation, results in outflow of human resources, for that reason, resulting in a decline in the productive capabilities of the population in mountain areas. It is well known that most educated persons migrate out of mountain areas.

Social Mobilisation Approach

Mobilisation of intended participants and beneficiaries of programmes, through formation of groups, participatory rural appraisal (PRA), and so on has been an important part of rural development and poverty alleviation programmes and projects in recent years. These processes have been found to help not only in improving programme delivery and outputs, but in making a significant contribution to building social capital. They have also helped, particularly in relatively better endowed and accessible areas, in accessing resources, services, and markets for productive activities. In mountain areas, however, these groups have often found it difficult, beyond a point, to use the awareness and organisation they have built for themselves to improve their livelihoods because of limited access to productive resources and exposure to markets. Some success has been achieved in this respect by those organised around a common interest like production of similar commodities and use of common property resources like forests. In other cases, even where the groups are able to pool their resources, they have not been able to put them to productive use. Notable examples are those of the several women's savings and credit groups through which large sums of money have been collected in small contributions, but have remained idle due to the lack of investible opportunities and/or of initiative on the part of programmes to identify and plan such opportunities.

Conservation Motivated Approach

It is widely feared that development of mountain areas, including development of poverty reducing activities, damages ecology and the environment. Therefore, any proposal for development activities, whether related to infrastructure construction or use of natural resources for productive purposes to sustain livelihoods in the mountains, is often perceived as a danger signal. Policy and regulatory mechanisms and practices that result from this perception are extremely restrictive. Thus, even a small rural road project remains blocked for years and is finally rejected; and banning the use of bio-resources by local people is considered to be the only way to conserve biodiversity. Alternative technological, economic, and institutional options and mechanisms are rarely considered to arrive at environmentally compatible solutions for development activities. Mountain communities, therefore, often feel that they are compelled to remain poor for the sake of environmental conservation which benefits others more than them. And no mechanisms to compensate them for this deprivation by way of alternative measures for alleviating their poverty are evolved.

a framework for poverty alleviation in mountain areas

Combination of Approaches

The above description of the limitations of various mainstream approaches, strategies, and interventions for development and poverty alleviation is not meant to pronounce their futility; but what it seeks to emphasise is the very partial character of each of them, which might still work in better endowed areas with only one or two missing links in the development chain. Mountain areas, as earlier emphasised, have several links missing due to their specific physical and concomitant socioeconomic characteristics. Therefore, the strategy of development and poverty alleviation for these areas needs to integrate elements of all these approaches, with suitably varying weights depending on the specificities of different areas. Some other basic elements of a strategy for development and poverty alleviation in mountain areas, emerging from the foregoing description of the nature and sources of their underdevelopment and poverty, are outlined below (Various elements of the strategy, along with the characteristics and sources of poverty in mountain areas, are also schematically presented in Annex 3.)

Recognition of Mountain Specificities

Mountain specificities consist of a set of conditions of which one sub-set (inaccessibility, fragility and marginality) represents constraints and another subset (diversity, niche and adaptation mechanisms) opportunities for development and poverty alleviation. Opportunities offered by the latter are not realised because of the constraints imposed by the former. The crucial issue is that of finding appropriate ways of mitigating and reducing the constraining influence of the former in order to ensure sustainable use of the latter. In other words, the approach to development and poverty alleviation in mountain areas has to be two-pronged: reducing inaccessibility, minimising the impact of fragility, and mainstreaming mountain economies and societies to reduce their marginality, on the one hand; and identification, development and, use of the diverse natural endowment, comparative advantage, and human adaptation skills, on the other. The two processes have to be integrated and to go on simultaneously.

Improving Access: Physical and Social Infrastructure and Energy

It is recognised, without doubt, that improvement in access of the mountain people to markets, technologies, and information as well to social services like education and health is vital for their development and for sustaining their livelihoods. It is also, at the same time, pointed out that improving access through building of physical infrastructure, such as road networks, dam-

ages the environment and is also very expensive, particularly in relation to the prospective returns on investment. The strength of economic argument against roads in the mountains depends on the time span for assessment of returns. Rates of return would also be considerably higher than otherwise estimated if planning of roads were to be integrated with identifying and using economic potential of road catchment areas. So far as the environmental argument is concerned, it seems to have been used too often without fully examining its force. Efforts, nevertheless, need to be made to explore and use technologies and methods of constructing infrastructure that minimise environmental damage and hazards. There have been experiments to deal with the problems of costs, environment, and economic benefits of roads in mountain areas (Banskota 1997), which need to be carefully assessed from the point of view of their wider application. At the same time, it has to be recognised that it may not be possible, within the foreseeable future, to provide road access to all mountain settlements; and, therefore, alternative ways of providing physical access, such as ropeways, power driven or gravity-based, and bridges have to be seriously considered as suitable options for very remote and inaccessible areas.

Building infrastructure for the provision of access to education and health services and information, including information on technologies and markets, should generally have no adverse environmental impact. It is, however, expensive because, given low population density and the small size and thin spread of settlements, it is necessary to have more schools and health posts, say per thousand of population, than in the plains to ensure universal access. Given, however, that the mountain people have as much right to these basic services as any other groups of population, society will have to bear the cost. New frontiers opened by satellite communication, information technology, and electronic media offer opportunities for distance education, as well as for accessing information on technologies and markets in a more economical than and equally effective manner as normal channels. Use of these opportunities on a wide scale needs to be seriously explored for the benefit of mountain communities.

Access to modern forms of energy is extremely important for improvement in the quality of life and productivity of economic activities. Mountain areas suffer from a paradox in this respect: they are endowed with large amounts of energy resources, especially water, but also biomass, wind, and solar radiation; but most mountain settlements and households have no access to electricity. For example, in Nepal only about five per cent of rural households have electricity connections, figures for rural Balochistan and North East India are 23 and 25 per cent respectively (Rijal 1999). Use of water resources is often bogged down in controversies about environmental impacts of large projects amidst which the needs of mountain people get completely sidelined. Environmental problems apart, large dams, in any case, provide little benefit to upstream mountain communities. It must be ensured that dams do not pose any threat to the lives and livelihoods of mountain people and mechanisms should also be developed to see that part of the revenue earned by these projects is invested in improving the lives of mountain people. Solution to the problems of mountain areas and households, especially of those not likely to be connected to the national grid system in the near future would, however, primarily lie in the development of small-scale, decentralised systems based on local energy resources (Rijal 1998).

Resource Base: Identification, Assessment and Access

It must be clearly recognised that the development of mountain areas, particularly of the kind that is likely to lead to poverty alleviation should be based on local resources. Therefore, it is necessary to identify such resources on an area to area basis. Uniqueness and diversity are

strengths of the mountain resource base that need to be focussed upon, as these areas cannot compete with products and services produced by non-mountain areas. Also, diverse resources require different approaches to identify, develop, conserve, and use them. The unique mountain environment in terms of natural beauty, scenic grandeur, biodiversity and ruggedness of topography as well as cultural heritage constitutes a kind of resource that needs to be conserved and promoted for tourism of various types. Limited arable land, the primary resource for the livelihoods of mountain people, needs to be put to uses and technological treatments that improve its productivity; and non-cultivated, non-forested land could be used in productive ways such as for growing horticultural crops and for commercial plantation in order to combine the economic and environmental benefits. Forests could similarly be developed, conserved, and used with suitable mechanisms to meet the twin objectives of environment and economy. In the case of water resources, many mountain areas face a paradox of plenty with scarcity: huge quantities of water flow down from the rivers, often with deep gorges, but villages above them face acute scarcity of drinking and irrigation water; and, there is heavy rainfall during a few months, while for the rest of the year there is drought. Access to water for drinking and irrigation from the rivers and harvesting rainwater through the use of appropriate technologies are of crucial importance for sustaining livelihoods. On the other hand, use of water resources for power generation, especially on a small scale, decentralised basis would lead to improved well-being and productive capacities of mountain communities.

It must be noted that productive resources available in mountain areas are, more often than not, thinly spread over space, each location offering a small quantity thus limiting the scale economies of production and marketing, and are also often liable to be rapidly exhausted if used indiscriminately without attempt at conservation and regeneration. This is particularly the case of non-timber forest products such as medicinal, herbal, and aromatic plant resources. A systematic assessment of the locations and quantities of such resources is, therefore, necessary from both the economic and conservation angles. Introduction of area wise, large-scale production and regeneration of resources can be useful and effective in this respect and needs to be systematically explored.

It is obvious that the mountain people should have access to local natural resources in order to use them for productive purposes. It is seen that access is denied to them, ostensibly for conservation. Thus, they cannot use or have only restricted access to plant resources from state controlled forests or protected areas and sanctuaries, to barren non-agricultural, non-forest lands and to river waters. Many communities have lost their traditional rights to these resources, as a result of new laws relating to forests and natural resources and with the conversion of large areas into sanctuaries and reserves. Regulating use of environmentally sensitive resources is quite understandable, although it is a debatable issue whether environmental degradation is caused mainly by the actions of local communities or results from policies and actions of the state or from those of large business enterprises outside mountain areas. But it should be possible to find ways to conserve the environment without jeopardising the livelihoods of the people. It must be noted that conservation efforts may have better chances of success if the local people are associated with them and also benefit from them. Mechanisms to entrust the task of managing, conserving, and using natural resources to local communities have been successful in some cases and could be emulated on a wider scale. Use of incentives and disincentives within suitable legal and institutional frameworks should be preferred over instrumentalities such as total bans and denial of access.

Collective Institutions

It is often forgotten that most productive resources are collectively, rather than privately owned in mountain areas. Leaving aside a small fraction of the land area under cultivation and a small proportion of land under non-agricultural uses owned by individual households, mostly in urban areas, all land, forests, pastures, and water resources are under state or community ownership. Therefore, livelihoods are, to a great extent, dependent on state policies and actions and the capability of communities to manage and use these resources and share the benefits among their members. Also, private actions of households in the use of resources under their control have significant externalities, both positive and negative, on the well-being of the communities. The role of communities and community-based organisations, therefore, is extremely important, not only for managing common resources, resolving conflicts, and determining access to and benefits from these resources, but also as channels for voicing the interests, concerns, and claims of mountain communities. In the specific sphere of productive activities, the small scale of production of individual households and units warrants that producers organise themselves to gain access to technology and inputs and marketing products in order to reduce transaction costs per unit of production and improve bargaining power to realise lower procurement costs and better product prices.

Area-based Approach

Diversity in ecological conditions and resource endowment and lack of connectivity with other areas within mountain regions warrants an area-wise focus in development. This is also likely to be more effective than the household-based targeting approach in view of the area, rather than household characteristics constituting the main sources of poverty, as argued earlier. Delineation of an area for strategic and programme interventions could best be done in mountain areas on the basis of a watershed approach, but it is necessary to combine socioeconomic features with physical characteristics to define and make a watershed the basis for planning of development and interventions to alleviate poverty (Papola 1996). At the same time, it must be recognised that a watershed, small or large, is a part of a wider economic space with linkages and inter-dependence with other spatial units. In this context, it is important to explore and develop rural-urban linkages and the role of small towns as market and service centres. These towns have a vital role as links between villages and cities located far away from most mountain areas. From the economic perspective, it would be useful to graduate from a watershed to a market-shed approach for development planning with a town in the centre providing market linkages to villages in the hinterland.

Use of Spatial Methodologies

Unlike in the plains, space is characterised by discontinuities and extreme and frequent variations in mountain areas. Therefore, any approach with a linear treatment of space will not be suitable here. Methodologies for resource assessment and development planning have, therefore, to be highly sensitive to spatial variations. Mapping techniques using tools like Geographical Information Systems (GIS), therefore, are of particular significance for mountain areas. Maximum use should be made of such methodologies in portraying living conditions and poverty, geographical distribution of the resource base, and infrastructure and market linkages for planning and implementing development and poverty alleviation programmes in mountain areas.

Role of the State

In the current context of emphasis on greater reliance on markets for development and poverty alleviation and only a minimalist role for the state as facilitator, mountain areas are in danger

of further marginalisation insofar as market failures afflict these areas more than other naturally and infrastructurally better endowed areas. The state, therefore, needs to continue not only investing in infrastructure and services, but also to evolve policies in favour of these areas to ensure that markets function better and that the risks and effects of market failures are minimised. Ensuring food security will be essential for facilitating diversification of mountain economies into market-oriented development of products with comparative advantage, and the state will need to play a role in this respect in the initial period until markets become profitable enough for private trade to take over. Pro-mountain policies can be well justified not merely on the grounds of equity, but much more on the plea that mountain people need to be compensated for the deprivation and cost involved in conserving an environment that is necessary for sustaining development and livelihoods not only in mountain areas, but also of the people and economies in downstream areas. In other words, investments made by governments and society as a whole, including the private sector, in the development of mountain areas and for the welfare of mountain people need to be seen as the price of environmental services rendered by them rather than as dole outs and subsidies in the conventional sense.

Analysis and Advocacy

Such an approach towards development of mountain areas and poverty alleviation among mountain people can emerge only if the government, civil society, private sector and international organisations are convinced that the fates of wider national and global economies and societies are linked to a great extent with those of mountain areas and people. It is, therefore, important that the issues of the valuation of mountain resources and costs and benefits of the mountain environment to local communities and for wider national and global development and sustenance, as well as highland-lowland linkages, are intensively and extensively investigated; their results widely shared with governments, private sector, and the international community; and appropriate mechanisms evolved for rational and equitable sharing of costs and benefits.

bibliography

- Acharya, M. (2000) 'Economic Opportunities for Mountain Women of South Asia: The Poverty Context'. In Banskota, M.; Papola, T.S.; and Richter, J. (eds) *Growth, Poverty Alleviation and Sustainable Resource Management in the Mountain Areas of South Asia*. Kathmandu: ICIMOD and Feldafing: Food and Agriculture Development Centre (ZEL-DSE)
- Bandopadhyaya, J (1993) 'Understanding Environment-Poverty Relationship in the Fragile Region: An Introductory Framework'. In Banskota, M. and Sharma, P. (eds) *Development of Poor Mountain Areas*, Proceedings of an International Forum. Kathmandu: ICIMOD
- Banskota, M. (1997) 'Mountain Accessibility and Rural Roads: Innovations and Experiences from Nepal'. In *Issues in Mountain Development 97/5*. Kathmandu: ICIMOD
- Banskota, M. (2000) 'Hindu Kush-Himalayas: Searching for Viable Socioeconomic and Environmental Options'. In Banskota, M.; Papola, T.S.; and Richter, J. (eds) *Growth, Poverty Alleviation and Sustainable Resource Management in the Mountain Areas of South Asia*. Kathmandu: ICIMOD
- Banskota, M.; Sharma, P. (eds) (1993) *Development of Poor Mountain Areas*. Proceedings of an International Forum. Kathmandu: ICIMOD
- Barbier, E. (ed) (1997) 'The Environmental Kuznets Curve', Special Issue, *Environment and Development* (3)
- Bennett, L. (1993) 'Access and Sustainability: Group-based Social and Financial Intermediation in the Nepal Himalayas'. Banskota, M.; Sharma, P. (eds) *Development of Poor Mountain Areas*, Proceedings of an International Forum. Kathmandu: ICIMOD
- Berkes, F. (ed) (1989) *Common Property Resources: Ecology and Community-Based Sustainable Development*. London: Belhaven Press
- Bhatia, A. (2000) 'Participatory Forest Management (PFM): Rediscovery of a Promising Mechanism for Poverty Alleviation in the Mountain Areas of South Asia'. In Banskota, M.; Papola, T.S.; and Richter, J. (eds) *Growth, Poverty Alleviation and Sustainable Resource Management in the Mountain Areas of South Asia*. Kathmandu: ICIMOD
- Bora, R.S. (1996) *Himalayan Migration: A Study in Hill Region of Uttar Pradesh*. New Delhi: Sage Publications
- Boserup, E. (1965) *The Conditions for Agricultural Growth*. London: Allen and Unwin
- Chand, R. (2000) 'Agricultural Development, Growth and Poverty in India's Mountain Region'. In Banskota, M.; Papola, T.S.; and Richter, J. (eds) *Growth, Poverty Alleviation and Sustainable Resource Management in the Mountain Areas of South Asia*. Kathmandu : ICIMOD
- Chopra, K.; Gulati S.C. (1996) 'Environmental Degradation and Population Movements: The Role of Property Rights'. In *Environmental and Resource Economics 9(4)*

- Chopra, K.; Kadekodi, G. (1988) 'Participatory Institutions. The Context of Common and Private Property Resources'. In *Environmental and Resource Economics 1(1)*
- Cleaver, K.M.; Schreiber, A.G. (1994) *Reversing the Spiral: The Population, Agriculture and Environment Nexus in Sub-Saharan Africa*. Washington D.C.: The World Bank
- Collins, J.L. (1987) 'Labour Scarcity and Ecological Change'. In Little, D.P.; Horowitz, M.M.; and Nyerges, A.F. (eds) *Lands at Risk in the Third World: Local Level Perspectives*. Colorado: Westview Press
- Dasgupta, P. (1995) 'The Population Problem: Theory and Evidence'. In *Economic Literature*
- Dasgupta, P. (1996) *Environmental and Resource Economics in the World of the Poor*. Washington D.C.: Resources for the Future
- De Janvry, A.; Gracia, R. (1988) *Rural Poverty and Environmental Degradation in Latin America: Causes, Effects and Alternative Solutions*. Rome: IFAD
- Deininger, K.; Mintzen, B. (1996) *Determinants of Forest Cover and the Economics of Protection: An Application in Mexico*. Policy Research Department Working Paper No. 10. Washington D.C.: The World Bank
- DFID, (2000). *Sustainable Livelihoods Guidance Sheets*. London: Department for International Development
- Dhungana, S.P.; Thapa, B. (1999) *Credit-based Micro-Enterprise Development Programmes in Nepal*. Discussion Paper Series No. MEI 99/1. Kathmandu: ICIMOD
- Dubey, A.; Kharpuri, O.J. (1999) 'Poverty Incidence in North-Eastern States'. In *Labour and Development*, Vol. 4, No. 1 & 2. 2 June
- Grossman, M. and Krueger, A. B. (1991) *Environmental Impact of a North American Free Trade Agreement*. Working paper No. 3914. Cambridge Mass: National Bureau of Economic Research
- Harriss, B.; Guhan, S.; and Cassen, R. (eds) (1992) *Poverty in India: Research and Policy*. Bombay: Oxford University Press
- Heath, J.; Binswanger, H. (1996) 'Natural Resource Degradation Effects of Poverty and Population Growth are Largely Policy-induced'. In *Environment and Development Economics*, 1(1)
- Henninger, N. (1999) *Mapping and Geographical Analyses of Human Welfare and Poverty; Review and Assessment*. Washington D.C.: World Resource Institute
- ICIMOD, (1997) *Districts of Nepal: Indicators of Development*. Kathmandu: ICIMOD
- HMG/NPC, (1998) The Ninth Plan (1997-2000). Kathmandu: National Planning Commission
- IFAD, (2001) *Rural Poverty Report 2001: The Challenge of Ending Rural Poverty*. Oxford: Oxford University Press
- Jagannathan, V.N. (1989) *Poverty, Public Policies and Environment*, Environment Working Paper No. 24. Washington D.C.: The World Bank
- Jodha, N.S. (1988) 'Poverty Debate in India: A Minority View'. In *Economic and Political Weekly Special 23*
- Jodha, N.S. (1997) 'Mountain Agriculture'. In Messerli, B. and Ives, J. (eds). *Mountains of the World: A Global Priority*. New York: The Parthenon Publishing Group
- Jodha, N.S. (1998a) *Poverty-Environmental Resource Degradation Links: Questioning the Basic Premises*. Issues in Mountain Development 98/1. Kathmandu: ICIMOD

- Jodha, N.S. (1998b) 'Poverty and Environmental Resource Degradation: An Alternative Explanation and Possible Solutions. In *Economic and Political Weekly*, Vol. 33, No. 36-37
- Jodha, N.S. (2000) 'Poverty Alleviation and Sustainable Development in Mountain Areas: Role of Highland - Lowland Links in the Context of Rapid Globalisation'. In Banskota, M.; Papola, T.S.; and Richter, J. (eds) *Growth, Poverty Alleviation and Sustainable Resource Management in the Mountain Areas of South Asia*. Kathmandu: ICIMOD
- Joshi, B.K. (2000) 'Development Experience in the Himalayan Mountain Region of India'. In Banskota, M.; Papola, T.S.; and Richter, J. (eds) pp. 171-194. Kathmandu: ICIMOD
- Kadekodi, G. (1995) *Operationalising Sustainable Development: Ecology-Economy Interactions at a Regional Level*. Amsterdam: Institute of Environmental Studies
- Khanka, S.S. (1988) *Labour Force, Employment and Unemployment in a Backward Economy*. Bombay: Himalaya Publishing House
- Kumar, S.K.; Hotchkiss, D. (1988) *Consequences of Deforestation for Women's Time Allocation: Agricultural Production and Nutrition in the Hills of Nepal*, IFPRI Research Report No. 69. Washington D.C.: International Food Policy Research Institution
- Kreutzmann, H. (2001) 'Development Indicators for Mountain Regions'. In *Mountain Research and Development*, Vol. 21, No. 2, May
- Lopez, R. (1997) 'Where Development Can or Cannot Go: The Role of Poverty Environment Linkages'. In *Proceedings of Annual Conference on Development Economics*. Washington D.C.: The World Bank
- Markandya, A. (2000) 'Poverty, Environment and Development', in Roze, A. and Gabel, L. *Frontiers of Environmental Economics*. Cheltenham, U.K.: Edward Elgar
- Markandya, A. (2001) *Poverty Alleviation and Sustainable Development*. Paper Prepared for the World Bank (mimeo)
- Metz, J. J. (1991) 'A Reassessment of Causes and Severity of Nepal's Environmental Crisis'. In *Journal of World Development*, 19(7)
- Narain, U. (1998) *Resource Degradation, Inequality and Cooperation*. Working Paper, Department of Agriculture and Resource Economics. Berkeley: University of California
- Papola, T.S.; Joshi, B.K. (1985) 'Demography, Economy and Environment in the Development of Hill Areas'. In Singh, J.S. (ed) *Environmental Regeneration in the Himalayas*. Nainital: Central Himalayan Environment Association and Gyanodaya Prakashan
- Papola, T.S. (1996) *Integrated Planning for Environment and Economic Development in Mountain Areas*. Discussion Paper Series No. MEI 96/2. Kathmandu: ICIMOD
- Papola, T.S. (2000) 'Contradictions in Development of Uttarakhand: Need for a Region Specific and Autonomous Planning Framework'. In Sati, M.C.; Sati, S.P. (eds). *Uttarakhand Statehood: Dimensions of Development*. New Delhi: Indus Publishing Company
- Prakash, S. (1997) 'Poverty and Environment Linkages in Mountains and Uplands: Reflections on the Poverty Thesis'. CREED Working paper Series No. 12. London: International Institute of Environment and Development
- Reed, David and Rosa, Herman, (1999) *Economic Reforms, Globalisation, Poverty and Environment*. New York: United Nations Development Programme
- Rhoades, R. (2001) 'Development Indicators for Mountain Regions: Comments'. In *Journal of Mountain Research and Development*, Vol. 21, No. 3, August

- Rijal, K. (1998) *Renewable Energy Technologies: A Brighter Future*. Kathmandu: ICIMOD
- Rijal, K. (1999) *Energy Use in Mountain Areas: Trends and Patterns in China, India, Nepal and Pakistan*. Kathmandu: ICIMOD
- Sadeque, S.Z. (2000) Poverty and Social Exclusion in South Asian Highlands. *Issues in Mountain Development 2000/1*. Kathmandu: ICIMOD
- Sen, A. (1999) *Development as Freedom*. New York: A. Knopf
- Stern, D.M.; Barbier, E. (1996) 'Economic Growth and Environmental Degradation: The Environmental Kuznets Curve and Sustainable Development', In *Journal of World Development*, 24(7)
- Tulachan, P.M. (2001) *State of Mountain Agriculture in the Hindu Kush-Himalayas: A Regional Comparative Analysis*. Kathmandu: ICIMOD
- Upadhyaya, H.K. (2000) 'Sustainable Poverty Alleviation and Mountain Development in Nepal: Status, Experience and Strategy'. In Banskota, M., Papola, T. S. and Richter, J. (eds). Kathmandu: ICIMOD
- UNDP, (1997) *Human Development Report, 1997*. New York: UNDP
- World Bank, (1992) *World Development Report*. New York: Oxford University Press
- World Bank, (1999) *World Development Indicators*. Washington D.C.: World Bank
- World Bank, (2000) *World Development Report 2000-2001*. Washington D.C.: World Bank
- UNFPA, (2001) *Foot Prints and Milestones: Population and Environmental Change*. New York: United Nations Population Fund
- WCED, (1987) *Our Common Future: The Report of the World Commission on Environment and Development*. Oxford: Oxford University Press
- World Food Programme, (2001) *Enabling Development: Food Assistance in South Asia*. New Delhi: Oxford University Press
- Zia, S. (2000) 'Growth, Poverty Alleviation and Sustainable Resource Management in Mountain Areas of Pakistan'. In Banskota, M.; Papola, T.S.; and Richter, J. (eds). Kathmandu: ICIMOD

Annex 1

Alternative Poverty Estimates Using Mountains/Hills Relevant Consumption Expenditure Norms

(An Illustration)

Poverty Lines Using Different Norms	Incidence of Poverty (% Households below Poverty Line)		
	Plains	Hills	Mountains
Mountain Specific Poverty Line (Rs. 33,000) - Calorie Intake-2600 - Modified Consumption Basket (+15%) - Local Price Level (+20%)			+25(70%)
Hills-Specific Poverty Line (Rs. 27,000) - Calorie Intake-2500 - Modified Consumption Basket (+10%) - Local Price Level (+15%)		+14(55%)	
Common Poverty Line (Rs. 20,000) - Calorie Intake-2300 - Modified Consumption Basket - Local Price Level	42%	41%	45%

Annex 2

An Illustrative Listing of Activities in Mountain Areas with Varying Economic Benefits and Environmental Costs

(Ranks are relative among 20 activities)

	Activity	Rank by Economic Benefit to Local People (Starting with Maximum)	Rank by Environmental Costs (Starting with Minimum)	
Assumption I Availability of Resource (Supply Base)	• Food grain cultivation	1	10	Assumption II Demand (Own Use or Market)
	• Fruit cultivation	2	2	
	• Off-season vegetables	3	3	
	• Livestock	4	13	
	• Agro-Processing	5	11	
	• Fruit Processing	6	12	
	• Timber Products	7	17	
	• Micro-Hydel Plants	8	5	
	• Medicinal Plants, Growing and Processing	9	6	
	• Bamboo Products	10	16	
	• Saw Mills	11	18	
	• Wool Based Textiles	12	14	
	• Handicrafts	13	7	
	• Trekking Tourism	14	9	
	• Conservation Tourism	15	4	
	• Stone Queries	16	19	
	• Cement Factories	17	20	
	• Electronic Products	18	8	
	• Bee-keeping	19	1	
	• Natural Fibre Based Products	20	15	

Notes: 1 List of activities is only illustrative. More could be identified.

2: Rankings are also illustrative, not necessarily based on detailed examination of benefits and impacts.

