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Integrated Planning for Environment and Economic Development in Mountain Areas Concepts, Issues and Approaches

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Preface

Development of mountain areas requires the simultaneous pursuit of two objectives: environmental sustainability and poverty alleviation. Mountain areas suffer from inaccessibility, fragility, and marginality, which place serious constraints on diversified and all-round development. Conventional approaches to development, commonly evolved with the plains as the geophysical space in mind, are, therefore, highly inadequate and unsuitable for mountain areas. The mountain perspective, with its specificities, both negative and positive, and sustainable management of the environment are essential ingredients of an appropriate development strategy for these areas.

In spite of recognising the need for a different approach, planning for mountain area development, particularly in the Hindu Kush-Himalayan Region, has not yet adequately internalised the basic ingredients of such an approach. Incorporation of environmental considerations into development planning, policies, and programmes has been only partial and project-specific; linkage between infrastructure and development and among different sectors and activities are not fully reflected in the formulation and implementation of development plans; the specific roles and significance of the potentials and contributions of women in mountain economies are not adequately recognised in planning for socioeconomic development; and the physical, social, and cultural characteristics of different mountain areas are often ignored in determining spatial units for planning in these areas. Most often these deficiencies are a result of the lack of appropriate methodologies and their inadequate use in planning and policy-making.

ICIMOD endeavours to develop and disseminate sustainable development approaches for mountain areas, with the objectives of conserving the mountain environment and alleviating poverty among mountain people. In that context, this paper attempts to raise various issues and come up with proposals relating to environment-development integration and intersectoral linkages, human resources' development and gender dimensions, and integrated area planning in mountain areas. It is hoped that it will generate awareness, concern, and discussion among planners, policy-makers, development workers, and experts interested in and concerned with the development of mountain areas.

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Introduction

This paper raises some basic issues and advances a few propositions in the context of approaches to development planning in mountain regions. It is based on the premise that the development of mountain areas, with the aim of sustainable improvement in the lives of the people inhabiting them, needs an integrated approach on two fronts: One, integration of environmental considerations in development planning and, two, clear understanding and concrete operationalisation of intersectoral linkages in an area-based planning framework.

The propositions and arguments advanced in this paper are already widely known. In fact, many of them can be found in the work carried out by ICIMOD in the past.¹ Additionally, they have been emphasised in international fora, particularly in the documents of the UN Commission on Sustainable Development (UNCSD) urging *"interested governments, with the support of the international community, to prepare and implement comprehensive national and/or local mountain development programmes in relevant countries as outlined in Chapter 13 of Agenda 21: The Mountain Agenda."*²

An attempt has been made in this paper to draw implications of various propositions advanced in relation to mountain development for planning and programme formulation, particularly in the context of the Hindu Kush-Himalayan Region. This exercise is expected to help develop principal components of a training programme and a programme for studies and research to generate inputs for training on integrated development planning in mountain areas.

The paper is organised in five parts. Part One deals with a possible approach to devising plans for the promotion of development activities within the constraints imposed by mountain ecology. Part Two argues for an integrated, rather than a purely sectoral, planning approach. Part Three deals with human resources' development with a special focus on the role of women in development. Part Four discusses various concepts of 'area' as a unit of planning and their suitability to mountain regions. And, the last part, recapitulating the earlier propositions and arguments, draws implications for planning methodology.

The Environment-Development Dilemma: Towards A Solution

It is by now a well-recognised fact that to achieve the two paramount objectives of development of mountain areas, namely, development of an economically and environmentally sound ecosystem and poverty alleviation through promotion of an ecologically sustainable and diversified structure of economic activities, requires a distinct development approach. The need to maintain ecological balance places a

¹ A list of ICIMOD documents of direct relevance to this theme is given in the Annex.

² Report on the Third Session (11-28 April, 1995) of UNCSD, as reproduced in the Report of the Organising Committee of the Mountain Forum, 21-25 September, 1995, West Virginia, USA, Annexure VIII. pp 26-27.

certain degree of constraint on development activities; to the extent that environmental conservation and development apparently imply two conflicting approaches. On the other hand, alleviation of poverty and improvement in the standards of living could offer better chances for environmental sustainability and ecological preservation, as poverty and environmental degradation are found to go together and are often generated by the same processes.³ In fact, the mountain ecology can offer a special advantage for certain kinds of income-generating activities. Often, such activities, in addition to being quite compatible with the needs of environmental protection, can even contribute to enhancement of the mountain ecology. In such cases, development and environment can be mutually supportive and reinforcing. The critical issue, therefore, is to choose a pattern of development activities that could best meet the two stated objectives.

Most development activities impinge upon the environment and adversely affect the ecological balance of the mountains. It would be unreasonable and unfair to the mountain people if, for that reason, no development activities were to be undertaken in mountain areas. A reasonable and realistic approach would be to evolve a structure of development activities that, in totality, produce the minimum adverse impact on the environment and, concomitantly, to make efforts to compensate, as far as possible, for the damage to the environment by regeneration of the lost natural resources. This approach requires both a feasible methodology and the competence to assess the environmental impacts. This should apply not only to individual projects and activities on an *ad hoc* and partial basis but also to the total interlinked structure of directly productive activities and the infrastructure essential for effective realisation of economic benefits.

The above approach to development planning for mountain areas recognises and pleads for the conscious and judicious use of the concept of a **trade-off** between environmental preservation and economic development. Development involves environmental costs and restricting development for environmental reasons also involves human costs. There are no 'either-or' solutions, but there are varying combinations of environmental and developmental impacts from which suitable choices can be made. On the positive side, two factors should be recognised: one, mountains can offer special advantages for the development of certain activities because of the availability of natural and cultural resources not found elsewhere; and two, the economic progress resulting in poverty alleviation and a significant and progressive improvement in socioeconomic conditions would result in an environment in which the mountain ecology can be conserved.

In spite of general recognition of the issues in environment-development interaction, these have not been incorporated into development planning for mountain areas, primarily because of the lack of appropriate methodologies for use by plan-

³ *Evidence for this proposition, specifically in the context of the HKH region, will be compiled and analysed on the basis of data being collected currently under the programme on the State of Environment and Development of the MEI Division, ICIMOD*

ners. For example, the existence of a 'trade-off' could be well accepted, but it is not clear how to measure it. No doubt, the acceptable level of gain-loss combination would ultimately be a matter of judgement, and the decision-makers would make decisions on the basis of the perceived priorities of their governments and societies. But, in the absence of knowledge about gains and losses, there would be no basis for decisions other than the ones that are likely to be closer to the extremes. In fact, the present debate on **sustainable development** has, in a sense, got stuck due to the inadequacy of tools and methods to translate the generally accepted propositions into practicable decisions and solutions. Assessment of economic costs and benefits—both private and social—though conventional and applied within a limited time-frame, have been used in planning, programme formulation, and decision-making for individual projects. However, these methods are inadequate for internalising environmental costs which cannot always be assessed in monetary terms. What is more, longer time-frames and more comprehensive spatial considerations are needed to assess environmental costs than those used in common economic assessment. Since comparison of costs and benefits is possible only when both are presented in similar, commonly monetary, terms, a methodology for 'pricing' mountain resources (if only in relative terms) is needed to measure environmental costs. Such costs primarily consist of depletion and degradation of natural resources and their consequences.

So far, efforts to include environmental considerations in planning and decision-making have been confined to undertaking environmental impact assessment (EIA) of individual projects. While EIAs are appealing because of their direct relevance and easy application, they fall short of **incorporating** environmental considerations into overall development planning due to their partial, project-specific, and *ad hoc* characteristics. Also, EIAs are useful mainly at the project stage and do not take into account changes that may occur after a decision has been made and the project implemented. Not only is it essential to assess the overall impact of the project during implementation and beyond, but also, more importantly, it is necessary to evaluate the total impact of the structure of activities linked to each other in the development process generated by a programme, project, and activity.

Furthermore, in a development-focussed approach, assessment of environmental impact alone is not sufficient for decision-making. First, it is not easy to decide on the cut-off point beyond which the adverse environmental impact of a project or programme would warrant that it be disallowed. Second, environmental impacts need to be juxtaposed against the economic benefits flowing from the project or activity, in order to strike a balance between the objectives of environmental protection and economic development. As mentioned earlier, insofar as they use or affect natural resources qualitatively or quantitatively, most activities produce an impact on the environment. Therefore, if one were to select only those activities for mountain areas that either augment or have no adverse effect on natural resources and the ecology, then the mountain people's options for survival and development would be extremely limited. Consequently, any development strategy for mountain regions would have to be based on the recognition that economic development would certainly use natural resources, and that this would lead to environmentally-sensitive activities. At the same time, it will have to be based also on the recognition that

certain kinds of activities would not be economically sustainable beyond the very short term because of their ecological unsustainability and, therefore, would have to be ruled out as options in mountain development.

In between the two extreme types of activity; namely, (i) 'environmentally-benign' ones, which have a high income-generating potential, along with the potential to improve the environment (e.g., growing medicinal plants and fruit trees), and (ii) 'ecologically disastrous' ones which may only provide large short-term profits to non-local entrepreneurs and contractors, but no sustainable gains to the local people, at the same time inflicting large-scale and permanent damage on the environment (e.g., extractive activities such as mining and indiscriminate exploitation of forests); there is a whole range of activities. These activities have various combinations of income-generating and environmental impact potential. It is important that the potentials of different activities that are feasible in mountain areas are assessed, on an area-specific basis, in order to identify those that maximise income and minimise damage to the environment. Available methodologies for EIA and assessment of income potential for precise quantitative estimates may prove inadequate, and they need to be further developed by natural resource and environment specialists and economists. It should, however, be possible, even with current methodologies, to rank or categorise activities in environmental and economic potential ranges and identify activities with relatively low environmental impact and relatively high economic potential, in general, and then, in particular, for a specific mountain region and areas.

Selection of a pattern of activity is only one, albeit crucial, step in development planning for mountain areas. Such a selection should attempt to integrate environmental and economic considerations, in order to fully reflect these two facets in the planning process. Integration with and among other aspects of development, such as infrastructure, technology, and markets, within the overall framework of 'mountain specificities', is essential. Interrelationships among these various elements of ecological and development systems should be an essential ingredient of policies and programmes for mountain development. A schematic presentation of these elements at the interface is attempted in Chart I.

Development Strategies: 'Lead Sector' Approach and Intersectoral Linkages

Two points need to be especially kept in mind during the assessment and ranking of activities on environmental and economic bases. Firstly, an activity's environmental and economic impacts need to be assessed in totality; and this should include the impact that the linked activities as prerequisites or resultants will produce. Thus, the impact has to be seen within an integrated and interlinked framework. Secondly, mountain areas are generally not suitable for a highly diversified economic structure because of problems of ecological fragility and inaccessibility, and, therefore, a limited number of activities based on the '**niche**' or **comparative advantage** of the area concerned should be considered for promotion. In other words, development planning in mountain areas will have to rely primarily on a lead sector(s) strategy, specialising in a few

sectors and avoiding development of all conceivable activities. This approach, no doubt, is contrary to the conventional notion of self-sufficiency and implies a larger role for trade in goods and services. This seems essential for the improvement of living standards in the mountains, as insistence on self-sufficiency is likely to condemn them perpetually to poverty. This has several implications, of course, relating to the access to markets, infrastructure, and, particularly, food security. But it should be possible to take care of these issues if mountain specificities are taken into account in national policies for the development of activity and programme structure, infrastructure, and public support systems in mountain areas.

A development approach requiring a shift in economic structure from one oriented towards subsistence and self-sufficiency to one of commercialisation, specialisation, and trade, immediately focusses on the importance of **infrastructure and related technologies**. Development of infrastructure, especially for **transport** and energy, in mountain areas requires special consideration of two aspects: one, its impact on ecology and environment and, two, its effective use for development of the local area and improvement in the standards of living of the people. There are specific problems in each of these aspects in the context of mountain regions. For instance, development of a road network involves environmental costs and hazards, besides requiring huge investments without necessarily bringing in commensurate returns. On the energy front, continuous use of fuelwood to meet the requirements of an increasing population leads to shrinkage of forests; and establishment of large hydro-electric plants with large dams has the potential for significant environmental and human dislocation. The issues of appropriate modes and technologies for the provision of infrastructure, therefore, assume special significance in the mountains. Technologies for road building and other construction activities that minimise ecological disturbance and environmental hazards and risks and use of non-road modes of transport, improving the use-efficiency of biomass energy, promoting solar and wind energy technologies, and generating electricity through mini- and micro-hydel plants are some of the options that need to be actively pursued to provide infrastructure in mountain areas.

Providing infrastructure does not in itself induce the development of income-generating activities in mountain areas, as postulated in the conventional theory of development. The linkages that develop on their own with the development of infrastructure in the plains do not easily materialise in the mountains. On the contrary, development of transport sometimes leads to more 'backwash' than 'spread' effects, through extraction and drainage of mountain resources for profit-making elsewhere. Thus, roads, for example, which have led to changes in cropping patterns through introduction of more remunerative crops, faster development of local resource- and skill-based products, and better financial returns as a result of access to markets in the villages in the plains, have only succeeded in bringing about a change in consumption patterns in favour of urban products paid for from remittances from the increasing number of migrants, with little or no impact on the production economy of mountain villages. Similarly, use of the generating capacity, even of the 'appropriate' micro-hydel power plants, has been found to be extremely low due to the lack of demand for non-domestic use. It is possible to sell electricity to outside users, and, in fact, in some mountain regions, plans to develop electricity as a tradeable commod-

ity are being seriously considered. This could be a useful development if the revenues realised from the sale of electricity could be used in the development of the region. This, in turn, would depend on the ownership of the power plants and suitable plans for the development of investment opportunities in the area.

In view of the weak linkages which characterise underdeveloped areas, in general, and mountain areas in particular, planning for infrastructural development needs to be accompanied by and integrated with planning for development of directly productive activities. It should be recognised that provision of transport facilities and power has the potential for improving the production economy and the standards of living significantly. In mountain areas, this potential can only be realised through integrated planning. In addition, the development of communication systems, despite having no adverse environmental impacts and being of crucial importance for marketing and trade, has not received adequate attention as a part of mountain infrastructure and needs to be recognised as a priority for mountain development.

In addition to the linkages between infrastructure and economic activity, linkages among different economic activities are equally important for effective realisation of the economic gains of development in an area. Even in a niche-based, lead-sector approach, in which trade plays an important role, development of minimum production linkages within the area is necessary for both cost-effectiveness and maximisation of economic benefits for a wider population. For example, processing of primary products, instead of mere production, collection, and export, would lead to increased value-addition, employment of the local labour force, and an increase in the 'spread effects' of development. Development processes and the use of new equipment and technology require various kinds of services and repair facilities. Normally, these forward and backward linkages are expected to develop on their own once the lead activities take off, but, in mountain areas, suitable conditions and policies have to be developed to realise these linkages.

An important aspect that needs to be kept in mind in a lead-sector, trade-oriented development process for mountain regions is the likely changes that may take place in economic and social structures, particularly in respect to equity. Mountain communities have, generally, not been known for a very high degree of economic and social inequality, since a predominantly subsistence-oriented economy does not produce either the super rich or the destitute. Privately-owned resources (basically land) do not have a highly skewed distribution, and all have access to public or community-owned resources. Social differentiation has existed on caste, tribe, and ethnic lines, but it has rarely resulted in significant social conflicts, because specific mountain conditions have necessitated the use of collective and mutually-supportive approaches for economic and social activities. A development process that is based on specialisation and production for the outside market introduces strong elements of commercialisation and a 'cash nexus', resulting in erosion of the traditional principles of collectivity and mutual obligation. It also leads to sharper economic differentiation among individuals and households on the basis of their resource endowments, education, social skills, and access to public officials servicing development, resulting in an increase in economic inequity. Any development strategy will, therefore,

have to ensure expansion of employment opportunities and broad-based development of human resources and skill formation, particularly among small-holders, the landless, and women, to ensure that the benefits of development are widely distributed.

A schematic portrayal of the interrelationships involved in sustainable and equitable transformation of a subsistence economy into a commercial economy can be seen in Chart II.

Human Resources' Development and the Centrality of Women

Planning for integrated development with the induction of modern infrastructure, commercialisation, and value-added production requires the introduction of new technologies and, therefore, human resource development is inevitably of special significance. Technologies that use resources without environmental degradation but lead to a significant increase in income levels; that conform to the requirements of mountain specificities; that are easy to learn, adapt, and operate; and that result in reduction in drudgery and physical burdens, especially for women, need to be developed. Besides the 'hardware' of technology, which may be easier to develop, greater attention needs to be given to the 'software' aspects in the use of technology and management of its processes and products. Thus, not only do we need to develop technical and vocational education and training with mountain-specific orientation but also the skills required in a market-oriented economy, entrepreneurship, management of enterprises, and marketing being among them. It must, however, be recognised that work-related education and training and their effectiveness in increasing productivity and raising incomes are only feasible and fruitful if there is a reasonably sound foundation of basic education and health services. Therefore, provision of social infrastructure must be an integral part of development planning, both to improve the quality of life and to provide necessary inputs for economic development. Planning of social infrastructure in mountain areas may, however, require innovative approaches in terms of costs of technologies and modes of institutional management. Local material-based, low-cost technologies and indigenous knowledge and practices and community management of resources and institutions need to be employed to the maximum extent possible, since conventional modes and technologies often prove too costly and inappropriate in inaccessible mountain areas and for traditional mountain communities.

In the socioeconomic development of mountain areas, an issue that assumes crucial importance is that of the role and status of women. The issue is important everywhere, but it has special significance in mountain areas because of the centrality of women in most socioeconomic activities. Several specific attributes of women's lives and activities in mountain areas are well-established and well-documented. Women are the principal producers in mountain agriculture. They are overburdened with the tasks of procuring the essential means for family survival, viz., water, fuel, and fodder. Additionally, they attend to the domestic chores of cooking, washing, and rearing of children, yet they are the worst victims of environmental degradation as it results in scarcity and, therefore, greater difficulty and longer distances are involved in procuring these items for the family. Quite often, they have to manage the

households because the males migrate out. In spite of all their contributions they do not have a role in making crucial household decisions, for example, in the purchase and sale of assets, education of children, and migration of individuals or the family. The prevalence of a large number of female-headed households in mountain areas may thus be a mere demographic phenomenon rather than an indicator of economic and social status. Besides, the traditional values and practices of a male-dominated society and the poor educational and health status of women also contribute to their being 'major workers but marginalised members' of the family.

In this situation, certain measures should be given priority by development planners. Such measures include development of drudgery-reducing technologies to enable women to have time for other activities as well as leisure and education (particularly in the case of girls). But, in the development framework outlined earlier, much more needs to be done to make women effective partners in the process of development. It has been observed that lack of education and skills prevents women from participating in productive and income-earning activities in a commercial, market-oriented development process based on cash-crop farming and non-farm activities. Whereas in a subsistence-oriented agricultural economy, they were the main producers without necessarily having commensurate social status, in the new situation they have become marginalised workers with no improvement in their economic and social power. Measures adopted to mainstream women have often failed, as they mostly emphasised training and assistance for women-specific activities (e.g., kitchen gardening, stitching) of the supplementary and low-income type. This has left them without prospects of upward mobility or equity. Only a radical change in thinking, recognising that women can do most jobs that men can do, and endowing them with the necessary skills (e.g., in processing, managing, and marketing of produce rather than mere farming and collecting of subsistence needs) can make them effective partners in development.

Area Planning: Delimitation of A Planning Unit

A critical issue that has been debated for a long time is the level — macro, regional, and area—at which the planning could best achieve integration of the various aspects described above. It should be noted that planning exercises at different levels cannot be independent of each other, and integration is needed at each level, although its nature and content would be different at macro-, meso-, and micro-level. Thus, mountain specificities need to be taken into account in their entirety at national and regional planning level. The mountain perspective should be the guiding principle in planning, in wholly, or predominantly, mountainous countries and regions. But, even in countries where only a part of the geographical territory is mountainous, national and regional planning strategies should leave enough scope for a distinct approach to the development of such regions. For example, a development strategy that primarily relies on, and a policy framework which favours, irrigated monocropping for agricultural development; large-scale, metal-based heavy manufacturing for industrial development; and large thermal and large dam-based hydroelectric plants for power development, probably has nothing to offer for the develop-

ment of mountain areas. These approaches may be necessary to attain certain national goals, but national plans should also leave scope and resources for different strategies for the development of the regions that cannot effectively participate in and benefit from the development processes based on them. And mountain regions are such regions.

The fact that mountain areas require a distinct approach to development suggests that mere decentralisation of planning is likely to prove inadequate for these areas. Decentralised planning, most often, has only meant the decentralisation of implementation of a centrally determined strategy. While such an approach may prove useful in the plains, where there is a relatively even distribution of natural resource endowments and spatial continuity, in mountain areas with their highly diverse and heterogeneous resource bases and spatial discontinuities caused by altitude, slope, and relief, 'autonomy' in planning in a real sense is required. In other words, plans for development of mountain regions have to be evolved on an area basis, so that they can take into account the specificities of resource base and achieve better integration between resources and activities, among activities, and between environment and development.

What spatial unit should be demarcated and adopted as the area suitable for integrated planning in mountain regions? The issue has been debated for a long time, although not necessarily in the context of mountain regions. In a decentralised planning approach, administrative units such as districts, *taluka*(s), blocks, villages, and so on have been used. And it is argued that, since these units are not necessarily coterminous with resource base areas, they are not always suitable for an area planning approach. The argument becomes more forceful in the case of hill and mountain regions where the variability of the terrain and the heterogeneity of the resource base render a linear and administrative demarcation quite unsuitable for development planning. Therefore, resource-based concepts, such as agroclimatic zones, sub-zones, and watersheds, have been advocated as more suitable planning units. These concepts have a lot of appeal for regional and area planners and could certainly be fruitfully employed in development planning for mountain regions. Yet, their limitations should be kept in mind and necessary modifications considered in their application.

A watershed is a natural geo-hydrological unit incorporating the area from which all surface water flows out naturally through a single channel. It is a naturally-defined unit of planning and development and may be demarcated more extensively as a macro-watershed or less extensively as a micro-watershed, according to need. At the same time, based on a one-dimensional concept, it may not completely account for the resources and potential of the demarcated area; and, being a purely physical concept, may also not incorporate sociocultural and economic homogeneity and diversity within and among demarcated areas. Agroclimatic zonation involves a larger number of variables within the broad area of natural resources, soil type, climate, temperature and rainfall regime, and captive water resources and is amenable to a broad or more disaggregated division of space by using value ranges of variables. The use of multiple criteria for demarcation in this approach can, however, lead to methodological problems insofar as different variables may not fall into the same range as stipulated for defining a zone.

Both concepts, based as they are primarily on natural conditions and resources, do not take into account man-made developments in an area, e.g., physical and social infrastructure, farming patterns and systems, and other economic activities. The areas being considered are not unexploited, and the existing levels of development become a crucial base for further development. Furthermore, both these concepts may provide a reasonable basis for planning for agricultural development and allied activities but would prove inadequate for planning development of other activities. Lastly, unless demarcation, on the basis of these approaches, by and large coincides with administratively-determined planning units, or unless the latter are modified to conform to the former, there are likely to be problems in the allocation of public funds for implementation of integrated plans for development of different areas. It is, therefore, necessary that the geo-hydrological and natural resource characteristics are supplemented by a sufficient level of infrastructural development and an economic activity base for defining areas as planning units. Administrative convenience in implementing a plan should also be considered, and areas may be differently defined, combining administrative boundaries and resource bases and development characteristics. In a district with relatively homogeneous agroclimatic features and a well-developed infrastructure, the entire district could be a planning unit. In another, more varied, situation, a watershed, macro- or micro-, could become an area planning unit without any implementation problems insofar as the area falls within a single administrative implementation unit, e.g., a district or a block. It is also important to recognise that a planning unit is not a rigid category, sacrosanct for all purposes. In fact, in planning different activities and services, different units would be necessary and relevant. Here, the concept and techniques of multi-level planning need to be introduced along with those of area planning.

Another important consideration for area development planning in mountain areas is the differentiation of areas by altitude, as the problems and potentials of development vary significantly between the high mountains and middle mountains, on the one hand, and between mountain regions and the lower hills, on the other. At the same time, the issue of **highland-lowland interaction**, not only in terms of water resource flows, silting, and soil erosion and the effects of environmental degradation in the high mountains on the life and economy of the lower hills and foothills but also in terms of the contribution of the uplands through outflow of resources, both natural and human, needs to be considered in an integrated framework. On the economic front, this aspect would also include issues such as terms of trade and sharing of costs and benefits of environmental protection and regeneration between the people living in the uplands and those in the lowlands.

Similarly, factors such as **rural-urban linkages** and planning and development of urban settlements assume critical importance in integrated regional and area planning in mountain areas. Unlike in the plains, urban centres in the mountains are not only few and far between but also, for the most part, very small and cannot qualify as urban in a social and economic sense; the fact being that governments so designate them in their population censuses. They are not industrial and commercial centres but rather administrative towns and/or centres for the retail sale of consumer goods to villagers and tourists. At the same time, they could become important as sources of consumer products and production inputs as well as pro-

viding links with the outer world for the commercial and market-oriented development of mountain villages. They, therefore, need to be integrated into the 'area' concept along with the villages, because they are hardly 'urban' and because they need to be developed as **market and service centres** for the overall development of the area. Separation of rural and urban areas for development planning would not only be futile but could also, in fact, prove to be counter-productive in mountain areas.

Methodological Issues

Methodologies for integrated and area planning using 'consistency' models and regional planning techniques are reasonably well-developed. They, however, need to be modified and adapted for integrated planning on an area basis for mountain regions in respect to (i) incorporation of environmental issues into the plan framework and (ii) intersectoral integration at the area level. On both these counts, existing methodologies are deficient. Plan models, mostly using an input-output framework to determine demand-supply balances and consistencies, have not internalised environmental parameters, and regional and area plans have mostly been an amalgamation of sectoral schemes and programmes without paying much regard to linkages among activities. The standard procedure for area planning exercises involves one or the other variant of the following sequence.

- Preparation of a resource inventory
- Review of infrastructural development
- Assessment of the level and patterns of development of different economic activities
- Study of the institutional mechanisms of the development process
- Analysis of the gaps in infrastructure, human resource, and institutional arrangements
- Identification of the potential development of different activities
- Planning for the provision of necessary resources, facilities, and institutional mechanisms for the realisation, as well as development, of the identified potential

Under each of these steps are a number of conceptual and technical issues. Numerous manuals and guides have been developed to elaborate and resolve them. What is important for the present purpose is to identify the critical modifications to be made to concepts, issues, and methodologies to account for the **mountain perspective**. This perspective, as developed in the past work of ICIMOD, consists of a set of **mountain specificities**, namely, inaccessibility, fragility, marginality, diversity, niche, and human adaptation mechanisms. The first three broadly represent constraints and the remaining three, opportunities, in mountain development. Basic factors underlying these specificities, their operational and development implications, as well as externalities of development interventions directed to different specificities, have also been elaborated in earlier work at ICIMOD. A number of ICIMOD activities used this framework to develop approaches to sustainable mountain development, particularly in the area of agriculture and farming systems. Based on both the conceptual work on mountain perspectives and application-oriented research and demonstration, ICIMOD has also

tried to elaborate upon the concept of **sustainability**, particularly in terms of its indicators, positive and negative, in respect to agriculture. A training manual for mountain area development planning is an idea worth considering. It should, however, be borne in mind that training for planning methodologies for integrated mountain development needs to be based on substantive and real world situations which could be used not only as illustrations of a standardised methodology of area planning, but also to lead to modifications and changes in the methodology itself.

Important factors and characteristics derived from mountain specificities, warranting distinctive techniques and methods for integrated area planning in mountain regions, have been indicated in earlier sections. Their methodological implications are recapitulated here.

First, the intimate and interactive links between environment and development necessitate complete **incorporation** of environmental considerations into development planning for mountain areas, instead of the generally practised, post-formulation assessment of environmental impact of a project or a programme. Efforts in the past have focussed mainly on categorising areas as resource-abundant and resource-deficient or on zonation of environmentally-sensitive areas (e.g., into green, red, and orange categories). The concept of carrying-capacity has also been used to assess the extent to which development activities could proceed without endangering the environment. These approaches have succeeded in highlighting the importance of environmental protection; but they have fallen short of evolving approaches that can strike a balance between environmental and developmental needs. Environmental impact analysis, on the other hand, has been applied to judge specific projects or programmes, without necessarily having a range of options for consideration. Methodologies for evolving alternatives from which a set of development activities causing minimum damage to the environment could be chosen for mountain regions, in general, and for specific areas with a varying resource base, in particular, have not been adequately developed. A quantitative assessment of the environmental sensitivity of different activities, in terms of both resource-use and resultant processes and activities, is needed. Ideally, an aggregate **index, or coefficient of environmental impact**, for each potential development activity is required. There are essentially two steps in this exercise: One, indicators of ecological health in terms of the state of natural resources need to be developed and, two, the extent to which a development activity affects these indicators, directly and indirectly, has to be assessed. Activities should be indexed according to their income-generating potential also in order to choose an activity structure that is sustainable in terms of both its impact on the environment and potential for income generation on a continuing basis. Simultaneously, the development plan should provide for the possible regeneration and replenishment of environmentally-sensitive resources which would be depleted, even if slowly, in the process of economic development.

Secondly, integrated planning in mountain areas requires the use of linkage analysis in operational aspects and not merely as a tool for estimation of demand-supply balances and output and investment requirements. For, due to the problems of inaccessibility and marginality, production linkages do not materialise without interventions. This is true of both linkages between infrastructure and directly pro-

ductive activity and those between different activities or different links in the production and marketing chain. Thus, development of transport infrastructure and power supply in themselves does not necessarily lead to the development of income-generating activities, nor does wide-scale prevalence of manually-operated, low-productivity activities, even considering the potential for high productivity and better incomes through use of power and access to outside markets, bring about development of energy and transport facilities. Similarly, production of primary commodities, even though on a significant scale, does not encourage development of processing facilities, thus depriving the producers of better incomes and others in the area of employment opportunities. Even an activity like tourism, for which mountain areas have a comparative advantage, is often found to have more 'leakages' than 'linkages' because there is no integrated approach to planning to link it with other local activities. **Integration** in mountain areas, therefore, has to be a **concrete** aspect of planning and not a mere methodological device. It must, at the same time, be recognised that, in operational planning, integration can be effective only if appropriately reflected in coordination among different sectoral agencies and departments, insofar as the responsibilities for sectoral development and activities and resources for that purpose are divided among line agencies.

Thirdly, in view of the centrality of women and their proven potential for hard work and enterprise, the gender dimension needs to be completely integrated into development planning in mountain areas: the 'special programme' approach is neither adequate for the development of women nor for using their potential to develop mountain areas and communities. Any planning methodology, therefore, needs to incorporate the **gender dimension** as well as the environmental dimension. Ways to equip women to participate effectively in new, dynamic activities and processes and enable them to make decisions on significant matters that affect improvements in the standards of living and welfare of their families should form an integrated part of area development plans. The principal focus should be on broadening the choices for women in relation to their work and time allocation.

Fourthly, the terrain and altitudinal characteristics of mountain areas require a **distinct treatment of space** in area planning methodology. As discussed earlier, agroclimatic zoning and watersheds provide, within certain limitations, useful concepts for this purpose. Different elevation and altitude ranges, which may also coincide with different agroclimatic and resource zones, could also be adopted as planning units. But in no case is an entire area, used as a planning unit in the mountains, going to be at the same altitude and with similar terrain and slopes (if so, it would not be a mountain area!). Therefore, spatial mapping for preparation of resource inventories and assessment of development potential has to be **three dimensional**. A tool such as Geographical Information Systems (GIS), now widely used for spatial depiction of all kinds of characteristics and their interrelationships, would be most useful for this purpose. It would, however, be necessary to determine the **nature and extent of data** necessary for integrated planning. Given the general limitations in respect to availability of data on a disaggregated area basis, and the time and cost involved in primary data collection, the tendency to ask for large-scale, highly detailed information should be avoided. Prior identification of the kind of information necessary and adequate for a clear conceptual framework of integrated planning should be made.

At the same time, planning on an area basis would also make it possible to fill in data gaps as and when they appear, as part of the process of formulating and implementing plans and programmes.

Lastly, the **institutional arrangements** for planning in mountain areas also need a distinct approach. As argued earlier, mere decentralisation, which commonly means decentralised implementation of the programmes planned from above, is not good enough for mountain areas: planning from below on an area basis is essential. Local institutional capacity-building and people's participation are necessary conditions for successful preparation and implementation of plans in this approach. The vagaries and exigencies of nature resulting from terrain and climatic characteristics have compelled the mountain people to evolve ways of cooperating and working together as communities. Historical, cultural, and ethnic specificities have introduced further specific dimensions to naturally-determined mechanisms in some mountain areas. This phenomenon, which takes the form of indigenously-evolved institutional arrangements, should be used and strengthened as far as possible by providing modern scientific, technical, and management inputs. These should be supplied by government and non-government organisations. Similar use should be made of the indigenous knowledge and practices developed by mountain people over the centuries as a part of their survival strategies. In other words, a methodology for preparing and implementing plans and programmes in mountain areas must incorporate the local institutional and human adaptation specificities, rather than mechanically applying institutional models developed elsewhere.

Chart 1: Interface Between Economy, Environment, and Infrastructure

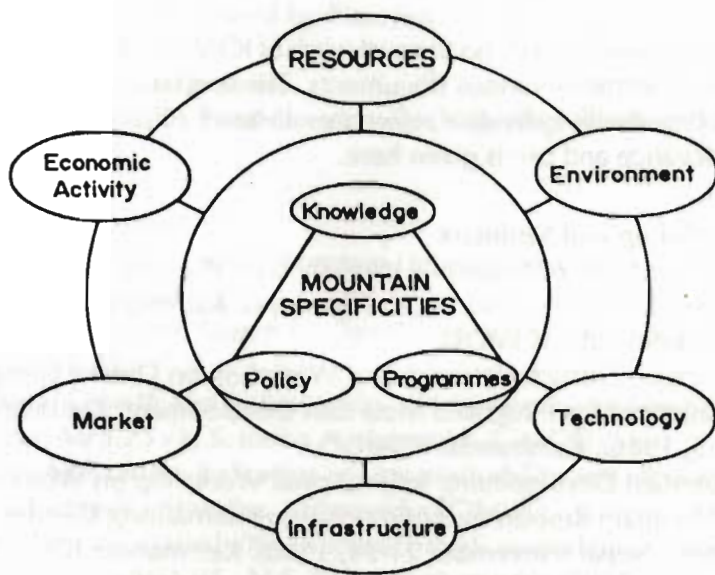
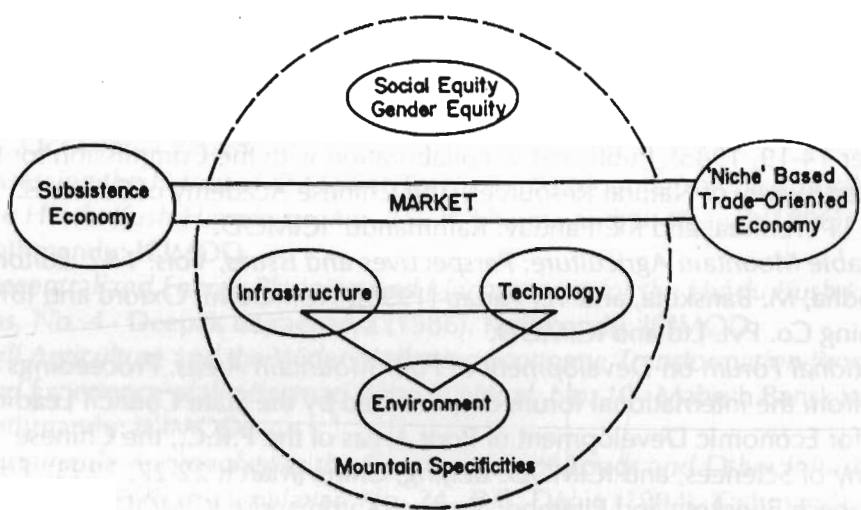


Chart 2: Sustainable Transformation Process



ICIMOD Documents of Relevance to Integrated Planning in Mountain Areas

This paper has drawn heavily on the past work of ICIMOD. Different ideas have emerged in different forms in various documents. The text has, therefore, not been burdened and cluttered with individual references. Instead, a list of documents found to be of direct relevance and use is given here.

I. Reports of Workshop and Seminars

1. *Towns in the Mountains*: International Workshop on Planned Urbanisation and Rural-Urban Linkages in the Hindu Kush-Himalayas. Kathmandu, Nepal (March 25-29, 1986). Kathmandu: ICIMOD.
2. *Energy for Mountain Districts*: International Workshop on District Energy Planning and Management for Integrated Mountain Development. Kathmandu, Nepal (May 3-5, 1986). Kathmandu: ICIMOD.
3. *Women in Mountain Development*: International Workshop on Women, Development, and Mountain Resources: Approaches to Internalising Gender Perspectives. Kathmandu, Nepal (November 21-24, 1988). Kathmandu: ICIMOD.
4. *Environmental Management in the Mountains*: International Symposium on Mountain Environmental Management in the Hindu Kush-Himalayan Region. Kathmandu, Nepal (April 11-14, 1989). Kathmandu: ICIMOD.
5. *Sustainable Development of Fragile Mountain Areas of Asia: Regional Conference Report*. Kathmandu, Nepal (December 13-15, 1994). Editors: Mahesh Banskota and Archana S. Karki. Kathmandu: ICIMOD.

II. Proceedings of Workshop and Seminars

1. *Watershed Management*: Proceedings of the International Workshop on Watershed Management in the Hindu Kush-Himalayan Region. Chengdu, China (October 14-19, 1985). Published in collaboration with the Commission for the Integrated Survey of Natural Resources, The Chinese Academy of Sciences. Editors: Li Wenhua, and Kk. Panday. Kathmandu: ICIMOD.
2. *Sustainable Mountain Agriculture: Perspectives and Issues, Vols. 1&2*. Editors: N. S. Jodha, M. Banskota, and Tej Partap (1991). New Delhi: Oxford and IBH Publishing Co. Pvt. Ltd and ICIMOD.
3. *International Forum on Development of Poor Mountain Areas*. Proceedings and papers from the international forum cosponsored by the State Council Leading Group for Economic Development of Poor Areas of the P.R.C., the Chinese Academy of Sciences, and ICIMOD. Beijing, China (March 22-27, 1993). Editors: Mahesh Banskota and Pitamber Sharma. Kathmandu: ICIMOD.
4. *International Symposium on Mountain Environment and Development: Constraints and Opportunities*. Proceedings and papers from ICIMOD's Tenth Anniversary Symposium. Kathmandu, Nepal (December 1-2, 1993). (Particularly

the paper, Integrated Planning for Mountain Environment and Development, by Mahesh Banskota.) Kathmandu: ICIMOD.

5. *Tourism for Local Community Development in Mountain Areas: Perspectives, Issues and Guidelines*. Proceedings of the Hindu Kush-Himalayan Regional Workshop on Mountain Tourism for Local Community Development, June 19-21, 1995, Kathmandu. Edited by Pitamber Sharma. Kathmandu: ICIMOD.

III. MENRIS Case Study Series

1. *Applications of GIS to Rural Development Planning in Nepal (1994)*. Kathmandu: ICIMOD.

IV. Discussion Papers

1. *A Framework for Integrated Mountain Development, MFS 1* - N.S. Jodha. Kathmandu: ICIMOD.
2. *Mountain Agriculture: Search for Sustainability, MFS 2* - N.S. Jodha. Kathmandu: ICIMOD.
3. *Agricultural Growth and Sustainability; Perspectives and Experiences from the Himalayas, MFS 25* - N.S. Jodha. Kathmandu: ICIMOD.
4. *Mountain Agriculture: Indicators of Unsustainability and Options for Reversal, MFS 32* - Sugandha Shrestha. Kathmandu: ICIMOD.
5. *Indicators of Unsustainability - Approaching Sustainability through Unsustainability, MFS 35* - N.S. Jodha. Kathmandu: ICIMOD.
6. *Perspectives on the Role of Women in Mountain Development: Two Papers, MPE 1* - Maria Mies, Bina Pradhan, and Katherine Rankin. Kathmandu: ICIMOD.
7. *Women and the Management of Energy, Forests, and Other Resources, MPE 3* - Deepak Bajracharya, Mahesh Banskota, Elizabeth Cecelski, Jeanette Denholm, and Sumitra M. Gurung. Kathmandu: ICIMOD.
8. *Watershed Management Experiences in the Hindu Kush-Himalayas: An Overview, MEM 3* - Kk Panday. Kathmandu: ICIMOD.

V. Occasional Papers:

1. *Assessing the Potential of Market Towns in the Mountains - Case Studies from the Hindu Kush-Himalayas, No. 25* - P. Sharma and N. Khanal (1996). Kathmandu: ICIMOD.
2. *Decentralized Energy Planning and Management for the Hindu Kush-Himalayas, No. 4* - Deepak Bajracharya (1986). Kathmandu: ICIMOD.
3. *Hill Agriculture and the Wider Marketing Economy: Transformation Processes and Experience of the Bagmati Zone in Nepal, No. 10* - Mahesh Banskota (1989). Kathmandu: ICIMOD.
4. *Sustainable Approaches to the Construction of Roads and Other Infrastructure in the Hindu Kush-Himalayas, No. 24* - B.B. Deoja (1994). Kathmandu: ICIMOD.

ICIMOD

ICIMOD is the first international centre in the field of mountain development. Founded out of widespread recognition of environmental degradation of mountain habitats and the increasing poverty of mountain communities, ICIMOD is concerned with the search for more effective development responses to promote the sustained well being of mountain people.

The Centre was established in 1983 and commenced professional activities in 1984. Though international in its concerns, ICIMOD focusses on the specific, complex, and practical problems of the Hindu Kush-Himalayan Region which covers all or part of eight Sovereign States.

ICIMOD serves as a multidisciplinary documentation centre on integrated mountain development; a focal point for the mobilisation, conduct, and coordination of applied and problem-solving research activities; a focal point for training on integrated mountain development, with special emphasis on the assessment of training needs and the development of relevant training materials based directly on field case studies; and a consultative centre providing expert services on mountain development and resource management.

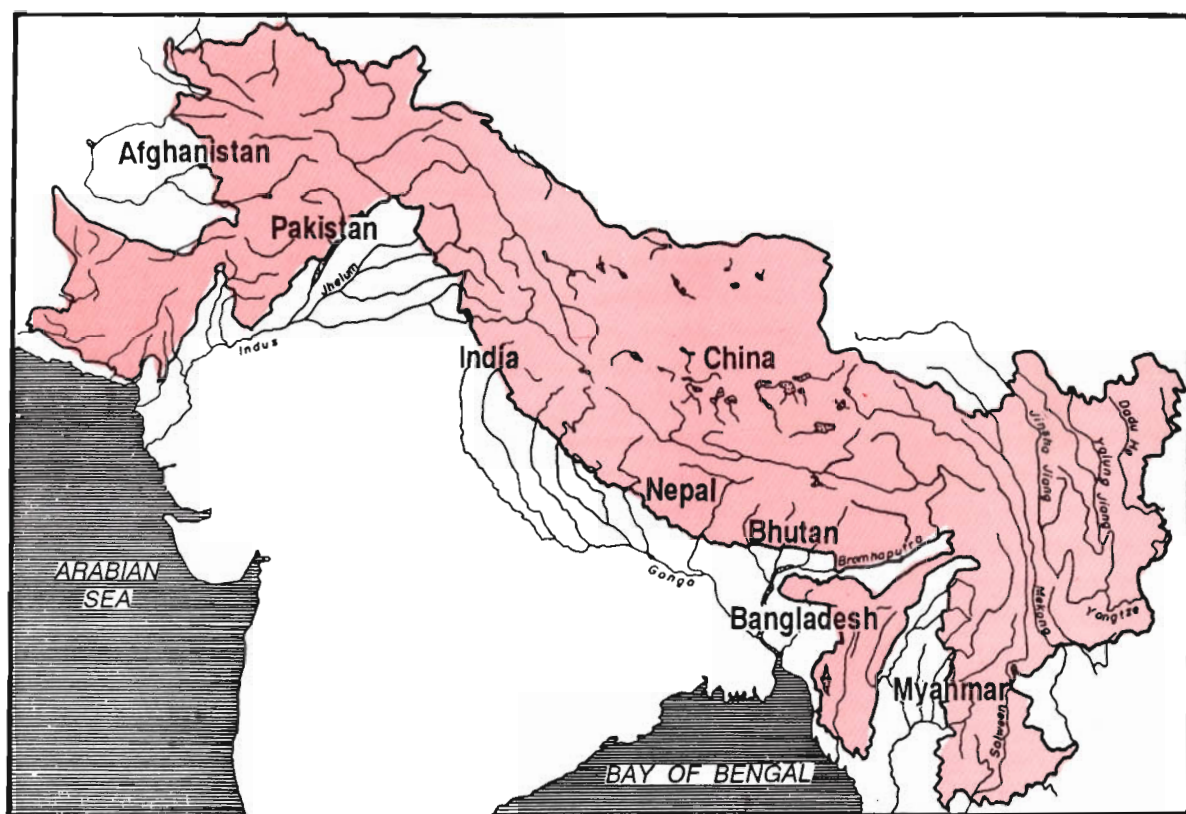
MOUNTAIN ENTERPRISES AND INFRASTRUCTURE DIVISION

Mountain Enterprises and Infrastructure constitutes one of the thematic research and development programmes at ICIMOD. The main goals of the programme include i) gainful enterprise development and income generation; ii) harnessing mountain specific advantages; iii) infrastructural development (social and physical); iv) sustainable energy resources for mountain development; and v) capacity building in integrated mountain development planning.

Participating Countries of the Hindu Kush-Himalayan Region

- * Afghanistan
- * Bhutan
- * India
- * Nepal

- * Bangladesh
- * China
- * Myanmar
- * Pakistan



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