

2. Mountain Habitats and Dominant Characteristics

The important conditions characterising mountain habitats, which separate them from the plains, include inaccessibility, fragility, marginality, diversity, and 'niche' (Jodha 1990 and 1992). In the present paper, we briefly introduce them and describe their implications in terms of the circumstances that tend to create conditions of poverty and to obstruct poverty alleviation measures in mountain areas.

Inaccessibility is a product of altitude and terrain and a major constraint in most mountain areas (Hewitt 1988). It obstructs mobility; leads to higher costs of transportation and other logistics for development interventions; imposes isolation and "closedness" on a system; and restricts the scope for higher productivity of resources through enhanced use-intensity, higher use of inputs, and resource upgrading, as these changes crucially depend upon mobility and external linkages. The sustainability of human welfare or survival under such conditions is closely associated with local, resource-centred diversification

of activities and a focus on the regeneration, protection, and recycling of resources and products, as well as collective sharing systems. The socioeconomic dimension of inaccessibility also means that people have limited access to the development gains of the mainstream economies. It also means that there are information gaps which make it difficult for decision-makers to arrive at successful intervention strategies vis a vis mountain habitats.

Fragility, a product of verticality, steep slopes, and other associated biophysical conditions, makes mountain areas most vulnerable to degradation, even with little disturbance (DEFIL 1988). Mountains thus offer limited resource use/production options which in turn have low payoffs. Fragility not only prevents a higher intensity of land use but also limits both the physical and economic scope of input use. There is limited scope for the use of external inputs, and for resource manipulation or upgrading, because of physical limitations and the associated high investment and maintenance costs. Fragility, therefore appears to be the most constraining factor in land use for high productivity through high use-intensity in mountain areas. The resource-use options, in the context of fragility, need to focus on land-extensive systems; a combination of productivity and protection measures; resource-upgrading using nature's own processes (e.g., use of soil building/binding plants); and intensification as permitted by adaptations of resource characteristics (e.g., terracing steep slopes before using them for cultivation). Delicate human life-support systems (vulnerable to collapse, following increased external pressures) also represent an aspect of fragility.

Marginality, like other mountain characteristics discussed here, has both biophysical and socioeconomic dimensions. It is a product of both natural and man-made factors (Blaikie and Brookfield 1987). Marginality shares most of the implications of fragility; e.g., limited and low payoff options and the high cost of upgrading resources which make the marginality of resources and people a major constraint to sustainable resource-use for high productivity and poverty alleviation. Accordingly, dependence on nature's processes (including regeneration), diversification, interlinkage of production activities, self-provisioning, recycling, and collective sharing are crucial to survival and growth in such an environment.

Diversity, or internal heterogeneity, resulting from a high degree of spatial, temporal, physical, and biological variability over short distances, is an important feature of mountain areas (Troll 1988 and Jochim 1981). This is a basis for both current and potential activities with significant interlinkages. If properly harnessed this offers potential for higher productivity, without damaging the production potential of the resource base. Under traditional systems, whether one looks at the human food chain, or income flows, or occupational patterns, the diversification was the linchpin of resource management and production activities. However, key requirements for such resource-use systems are the understanding and the harnessing of land resource diversity in order to avoid narrow specialisations that violate the imperatives of diversity.

'Niche' represents the special situations prevailing in mountain areas wherein the resource base and environmental conditions create the potential for products and activities that have a comparative advantage over the plains (Brush 1988). Irrigation and hydropower potential, timber and tourism, and minerals and medicinal plants, are some examples of mountain 'niche'. Most of its implications are quite similar to those of diversity as it is partly a manifestation of the diversity of mountain resources. 'Niche' offers a number of opportunities for resource and product-centred activities which could enhance both productivity and human welfare on a sustained basis. "Harnessing with protection" has to be the key focus of interventions addressed to 'niche'. Many of the multiple 'niche' in the mountains are linked to land-based activities.

It should be noted that within mountain areas or within single valleys, the above specificities vary significantly (e.g., all areas are neither uniformly fragile nor equally inaccessible, etc). Furthermore, most of the above characteristics, due to their common biophysical foundations, are interrelated. Modifying one may influence the others.

Mountain communities, through generations' of experience, have understood these differences and have evolved methods of adapting to the limitations and potential of mountain conditions (Guillet 1983). Various features of traditional farming systems and resource management reflect them. They involve either amending the circumstances to suit human needs (e.g., terracing of steep slopes for cultivation) or focussing on activities (e.g., mixed farming, intercropping) that could make efficient use of diverse resources. In addition to technological measures, the adaptations include institutional arrangements such as the provision of common property resources and the employment of social sanctions to regulate the use of fragile resources. This paper briefly refers to them under the section on traditional coping strategies.