

2. Interdependence of Social, Economic, and Biophysical Variables in Sustainable Mountain Development

The HKH mountain region is a unique habitation for over 120 million people who eke out a subsistence from a very fragile and geologically-active ecological zone. Climatic variations are broad-ranged, and distance-wise these are very rapidly changing, thereby limiting the diffusion of technologies and innovations. The mountain ridges have been traditional dividers of communities and ethnic groups. The HKH region, thus, boasts of numerous ethnic groups often cut off from one another by physiographic conditions, remaining isolated because of social and cultural factors. Many ethnic groups do not interact with their neighbouring communities, thus remaining isolated from one another even while being within spatial proximity, mainly due to historical events, different lifestyles, notions of pollution and purity, and value systems.

The extent of poverty and marginality and the low level of access to social infrastructure of the HKH people are by now well acknowledged and documented (ICIMOD 1994). Therefore, sustainable and incremental development is an imperative for the countries of the region that share this unique ecological zone. However, as ICIMOD has learned over the years, sustainable management of a fragile ecosystem requires a systemic approach in which mountain specificities are looked at in an integrated manner with the central focus being on human beings living in the area.

Over the years, the concept of sustainable development has been defined and redefined by people of different disciplines and each has voiced the centrality of their concerns. While sustainable development in the most prevalent sense means to *"meet the needs of the present generation without compromising the needs of the future generation"*, as defined in the seminal treatise 'Our Common Future' (WCED 1987), the emphasis and approach can differ amongst scientists and researchers. Economists would seek to maximise human welfare, often expressed in quantified terms of increased incomes and so on, with the existing capital stock and technologies available. Ecologists, including most biophysical scientists, would argue for the preservation of the integrity of ecological sub-systems, physical regimes, and species within them. Sociologists would argue that social considerations must be incorporated into devising solutions for sustainable development. This indicates that the sustainability of a system will be at stake if social and cultural issues are not given due importance in policy and other interventions. This is the crux of the argument centering around the term 'Social Sustainability' (Cernea 1994). Broadly, this new addition to the seman-

tics of development literature states that if projects are not designed incorporating social and cultural considerations, i.e., predicting the social consequences of interventions and making room for the desired participation of beneficiaries, they will not be socially sustainable in the long run.

While economists, ecologists, and sociologists would all like to emphasise the centrality of sustainability of the system, each of them adheres to their own disciplinary focus in emphasising the approach to attain it. Also important is a set of their own specific priorities that they wish to pursue in order to define the concept and attain the objectives. Thus, the economist's chosen terms for growth and efficiency would stand against the ecologist's preferred emphasis on ecosystemic integrity and carrying capacity and, in turn, the sociologist's concern for empowerment, social and institutional organisation, cultural identity, and so on. In such an environment of different disciplinary perspectives in the quest of the ultimate objective, i.e., sustainability, the term only becomes confusing and perhaps inflicted with contrasting and often incompatible methods. What is needed is an organic synthesis of each of the proponent's concerns in such a way that it does not undermine the centrality of the concept itself. Without delving into the attendant methodological debate over what constitutes valuation of resources, social sustainability, and ecological integrity, one can argue for the superiority of an integrated approach that takes into account the economic value of resources, the importance of social organisations, the necessity of preserving bioresources, and the characteristic interdependence of variables that affect the lives of the people for whose sustenance the concept has been developed in the first place.

When this interdependence issue surrounding sustainability is perceived in the context of mountain regions, particularly the ICIMOD-mandated HKH areas, the holistic nature of the concept becomes even more pronounced. Most HKH residents are overwhelmingly dependent on some form of primary production, utilising the fragile natural resources around them, be they steep slopes for cultivation or high altitude plateaus or other rangelands for animal grazing or slow-growing temperate forests on high mountains and slopes. Heavy rainfall, wind and gales, and snowmelt induces land degradation and infrastructural damage, exposing the vulnerability of those living in and tending to subsistence activities in the fragile ecosystem. Species' reduction and loss are invariably the consequence of such traditional subsistence processes. Being isolated and remote presents another set of constraints that hinder the mountains from benefiting from alternative opportunities. Therefore, the traditional economic wisdom calling for 'growth' and 'efficiency' in the economy and production system, if applied uncritically to the mountain areas, may not provide the desired results, as such an approach, for no fault of its own, would suffer from inherent limitations due to the fragility of the ecosystem and the inaccessability and remoteness of the locales. The main constraint and limitation of a purely 'economistic' approach for mountain areas is that it cannot fulfill the critical environmental and social sustainability aspects of programmes and activities.

What is needed here is to combine the knowledge from different fields of social science in order to be able to appreciate the social setting, as this will certainly influence the economic parameters and therefore should be taken into consideration. Again, the maintenance of ecosystemic integrity and biodiversity protection also should be understood, although these should not be viewed in isolation from the needs of the communities living in the so-called eco-zones. In addition to the needs of the communities, their aspirations and cultural and religious values are also important issues to be considered, if we wish to understand them and consider them to be at the centre of all development activities. This means development planners should endeavour to understand the world view and preference of the communities before devising development plans for them within the centralised planning process. Nevertheless, it also needs to be stated here that the culture and the traditional ways of life of mountain communities, however remote or isolated, should not be looked upon as static entities, as changes resulting from education, exposure to media, and contact with outsiders are powerful enough to be felt all over the region.

The HKH region is also unique as a densely-populated marginal area in which the population is growing at a rapid rate, even in the face of such Herculean obstacles and harsh living conditions. The human activities of such a vast population (more than 120 million) also affect the lives of hundreds of millions of others living in the plains and downstream from this great region. Its people are drawn from numerous ethnic groups, many of them scattered in more than one nation state. They profess all the major religions of the world, namely, Buddhism, Hinduism, Islam, Christianity, and numerous other forms of nature-ancestor worshipping traditions. Ethnically, culturally, and by religion, they are many different communities, sharing a common and contiguous mountain range which has a great diversity of climatic and physiographic patterns and bioresources. Living under the influence of this gigantic mountain range, people have learned to live with this 'great equaliser' and subsist from the resources that lie within. People's lives, occupations, food habits, technology, aspirations, and myths have all been shaped by the mountains — their altitudes, slopes, and climatic variations. The (physical) verticality has also given rise to very complex and interesting social structures, settlement patterns, and trade-subsistence links amongst communities living at different altitudinal levels.