

Chapter 9

Highland – Lowland Linkages in the Globalised World

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PREVIEWING THE ISSUES

Primarily because of their biophysical features and their operational imperatives, highlands (mountains and hills) and lowlands (plains) are endowed quite differently regarding resources and production opportunities. This forms the basis for complementary economic links between the two, manifested through exchange of resources, products, and services. However, the actual materialisation of such exchange-based complementarities depends on the means and mechanisms characterising exchange processes between highlands and lowlands. The mechanisms and processes in turn are influenced by the relative differences in the biophysical as well as socioeconomic constraints and capacities of the two entities in terms of generation and exchange of products and services.

This paper discusses these aspects by first elaborating on circumstances in mountain areas which obstruct production, generation of surplus, and trading—i.e., harnessing and equitably exchanging their products, services, and resources with lowlands. Here we also allude to factors that weaken the position of highlands as trading partners, leading to unequal highland–lowland economic links. Possible approaches and emerging trends towards changing these links are also commented upon. The latter also includes altering the factors (e.g., limited accessibility and lack of local capacities and commercialisation) responsible for the weaker positions of highlands as producers and traders of products and services in which they should have comparative advantages. Another important issue is the impact of highland–lowland links on poverty in mountain areas both at macro and micro levels. The issues of unequal highland–lowland links and their poverty related implications are elaborated upon by linking them to the nature/types of flows—products, services, and resources (including human resources).

The discussion is conceived in a dynamic context, where not only changes in highland–lowland flows and the factors behind them are indicated, but

the whole situation is reassessed in terms of economic globalisation. The rising concern for compensating mountain areas and communities for their environmental services provided as global public goods to the lowlands constitutes an important part of the discussion. Finally, the paper attempts to indicate methodological steps and approaches to generate evidence on different aspects to promote complementarities between highland–lowland economic links.

THE ROOTS AND RATIONALE OF LINKS

Economic links between two systems or regions are manifested by the mutual flow of resources (including human resources), products, and services under an exchange system as mediated by market forces, state interventions, or the interactions evolved by people (e.g., barter systems). The type and extent of these flows are rooted in the differences between highlands and lowlands in terms of basic resource endowments, ways and capacities to harness them, and the patterns of exchanging them with each other.

Table 1 sketches the basic elements of a framework to understand the nature and type of these links. Column A indicates the broad potential steps or stages in the process and relates them to specific conditions of mountain areas (columns 2 to 5) to see how the latter obstruct or facilitate the linking processes at different stages.

Table 1: Factors Affecting Highland–Lowland Links

A. Factors/Conditions Facilitating Effective (Complementary) Highland–Lowland Economic Links	B. Specific Features of Mountain Areas Favourable (+) or Unfavourable (-) to (1)				
	Limited Accessibility (Difficult & Costly Logistics) ¹	Fragility (Obstruction to Intensification for High Productivity) ²	Marginality (Low Resource Productivity, Low Incomes) ³	Diversity (Source of Multiple Productive Options) ⁴	Niche (Unique Resources with High Economic Gains/Potential) ⁵
(a) Natural resource endowments/ activities/products with potential comparative advantages				(+)	(+)
(b) Capacities/facilities to harness – including processing etc – to generate tradable surplus for reinvestment/ development etc.	(-)	(-)	(-)		
(c) Capacities/facilities for equitable external exchange/ trading of the products/ resources/services	(-)		(-)		

Table 1 can offer useful directions towards understanding several aspects of the highland situation covered by this paper. It can help us understand the scope for potentially complementary highland–lowland economic relations; how this complementarity could be operationalised or disregarded; how mountain conditions promote poverty processes and unequal highland–lowland economic links; and possible ways to address these problems. First, let us focus on the poverty aspects.

1. **Limited accessibility**, isolation, semi-closed situation created by slope, terrain conditions, and permanent underinvestment in addressing the problem. This adds to the cost of logistics and other support systems to harness production opportunities and their competitiveness and equitable trade.
2. **Fragility**, a product of slope, edaphic factors, etc. Not only prevents intensification of land resource use for high productivity but obstructs infrastructural development to improve accessibility to facilitate mobility and trade at lower/competitive costs.
3. **Marginality** of production caused by factors listed under above (1 and 2) and socioeconomic, geopolitical marginality of mountain habitats again caused by e.g., poverty, vulnerability, limited economic options, or domination niche.
4. **Diversities** of the resource base as a source of spatially and temporally different positive and high payoff production opportunities, if properly harnessed and traded.
5. Major known **niche** resources (hydropower, timber, [non-timber forest products] NTFPs, minerals, eco-tourism, etc.) with a comparative advantage in the highlands.

Poverty implications of mountain specificities

Viewed in the poverty context, the factors described by Table 1 also explain the processes contributing to persistent poverty in most of the highlands (except easily accessible valley areas). The conditions historically associated with enhanced economic performance in most parts of the world—namely resource use intensification, productivity gains from access to and use of high productivity input and investments, efficient infrastructural support, and external links for profitable exchange of the surpluses—are not readily satisfied in mountain areas due to the fragility, inaccessibility, marginality, and so on listed in Table 1. Thus mountains have situations that not only obstruct favourable highland–lowland economic links, but also tend to perpetuate poverty in most parts of these regions (Jodha 2000).

Efforts to enhance productivity through intensification, narrow specialisation, and overexploitation of marginal, fragile, and heterogeneous

resources (as tried in many HKH areas) accentuate the cycle of resource degradation–reduced productivity (or increased scarcity), compelling further intensification, leading to still more resource degradation and poverty. Efforts to exploit niche resources and trade their products that disregard the problems of limited access and missing local capacity further accentuate the inequities of highland–lowland exchanges, as they reduce the bargaining capacity of mountain communities in interacting with lowland mainstream agencies. Broadly speaking, inequality of highland – lowland economic links and persistence of poverty in mountain areas are rooted in mountain specificities. The lack of serious and appropriate efforts towards raising resource productivity in fragile mountains, sustainable harnessing and regenerating of niche resources, and ensuring equitable trade promotion based on mountain perspectives (i.e., explicit incorporation of imperatives of mountain specificities in interventions) are also rooted in socioeconomic and geopolitical marginality of mountain communities and their invisibility and voicelessness vis-à-vis lowland mainstream systems.

Past patterns of economic flows

In the context of complementary highland–lowland economic links, Table 1 indicates the potential where lowland flows or support can fill the gaps indicated by negative (-) conditions faced by the highlands and the latter can generate flows based on positive (+) attributes that can help the lowlands. How far this projected ideal scenario of complementarity materialises depends on several factors. To understand and analyse them, one should look at the past and current patterns of mutual resource flows.

Despite their constraining features, highlands in the past have had flourishing civilisations and stable economies with low population pressure and need-based, niche-based external links (e.g., the trade histories linked to the Silk Route and caravan trade). However, in due course, the external world transformed rapidly in terms of accessibility and means of communication, production systems and technologies, productivity and efficiency, specialisation and logistic support systems, and finally trading culture and links, which transformed them into dominant entities vis-à-vis the highlands (Kreutzmann 2000). Highlands became marginal entities, and this transformation over time promoted unfavourable terms of trade for them. Imbalances between the highlands and lowlands became a pattern.

As indicated in Table 2, some efforts initiated by governments have attempted to promote productivity of fragile and marginal areas; promote infrastructure to address inaccessibility; and to promote raising human capacities through social sector services, etc. Similarly, niche opportunities to export niche products, resources, etc. have been promoted.

However, while promoting productivity in fragile, marginal, diverse areas, lowland initiatives (i.e., support and flows) are governed by the lowland's perspective of highlands rather than their strict relevance and appropriateness to highland situations. This includes infrastructural development, which is often attempted with little attention to the side effects on fragile eco-systems, causing both economic and environmental damage, as indicated by major roads linking mining areas or hydropower projects in HKH countries.

The harnessing and trading of niche resources (timber, water, hydropower, minerals, and so on) have been promoted and facilitated by lowland policy-makers, but largely on the pattern of hinterland–metropolis links. This implies exploitation and trading of primary/raw products rather than processing them into value-added products. Most infrastructural development has been tied to activities serving primarily lowland needs. Local capacity-building and involvement in the above-mentioned major niche exploitation are quite minimal. Some small-scale niche opportunities (e.g., fruit, flowers, herbs, and so on that are not easily handled by external agencies) are an exception to this.

For a variety of economic, political, and technological reasons, the lowlands have helped to harness highland opportunities that mainly helped the lowlands. The negative implications of this were further aggravated due to the unequal positions of highlanders and lowlanders as trading partners and consequent unfavourable terms of trade for highlanders. Several export flows (both traded ones and non-traded ones) from the mountains are neither appropriately priced nor fully compensated for (Banskota and Sharma 1999).

Different categories of flows are summarised in Table 2. Table 2 presents a generic picture. Within the mountains there are cases with very complementary trade links with the plains. Similarly, several developed areas and better accessed valleys within mountain areas represent the situation of the lowlands when compared to areas with high altitude, steep slopes, and difficult terrain.

ECONOMIC FLOWS AND FRAMEWORK TO UNDERSTAND THEM

As an initial step towards understanding, documenting, and quantifying highland – lowland economic linkages, we can group the flow of items into the following categories (Jodha 1997).

Table 2: cont....

5. Repercussions of globalisation	<p>(-) Gains of special products (fruit etc.) eroded by trade liberalisation</p> <p>(+) Identification of new options as demanded by export markets</p> <p>(-) Over-extraction of niche resources/products with increased demands/ external markets</p> <p>(+) Rising voices for fair terms of trade</p>	<p>(-) 'Corporatisation' of natural resources with marginalisation of state; disregard of customary rights **</p> <p>(+) Increased private sector investment possibilities</p> <p>(+) Rising concern and advocacy of community interests; compensation for environmental services</p>	<p>(-) "Exclusion" of locals from transformation process due to lack of skills/ capacities/ investment resources</p> <p>(+) Advocacy for equipping mtn. communities for changes</p>	<p>(-) Decline of social transfers, support systems, social security net broken, increased differentiation in rural society</p> <p>(+) Progressive areas responding to new challenges</p> <p>(+) Emerging alliances between community & private firms</p>
6. Possible approaches to address the above problems	<p>Alter terms of trade by realistic pricing; local processing (value adding); improving local skill levels and infrastructures; and suitable sharing or compensatory mechanisms; supplement natural niche by manmade niche</p>	<p>Evolve/implement appropriate compensatory mechanisms for both 'managed', and 'semi-managed' resource flows; especially in globalisation context</p>	<p>Build infrastructure, enhance skills, and encourage local high wage employment, enterprises to reduce migration; impart higher skills for higher earnings</p>	<p>Appropriate and enhanced investment in mtns. to raise their productivity and comparative advantage; local participation in development decisions; evolve special provisions for mtn. areas in WTO rules</p>

Key: *The table presents a generic picture of the situation. Within mountain regions some areas, especially better accessible valleys, which represent situations comparable to the lowlands (plains)

a. Flow from highlands; b. Flow from lowlands.

(+) Positive links/developments for highlands; (-) Negative links/developments for highlands

** The term 'corporatisation' is used here in the sense of the unprecedented primacy given to market forces in the context of decisions regarding investment in natural resources and their use. It is used in the sense of 'capture' by multinational corporations of states and the willingness of those states to carry out pro-market policies to promote direct foreign investment.

Traded commodity and service flows

This includes the following: (a) special mountain products such as herbs, flowers, seeds, fruit, and vegetables in which the mountains have a natural comparative advantage. Initially a part of petty trading, these items are increasingly becoming a major component of trade. To the above (a) one can add (b), timber and other forest products. Historically and currently these items represent a major under-priced export from the highlands to the lowlands. The next item (c) includes hydropower, which is a new item on the list but often produced and exported without direct involvement of or benefit to highland communities. Finally (d), tourism, is a major high-value service provided by the highlands, again with very marginal involvement of highland communities in managing the service or securing gains from it.

The dominant features of these activities and product flows include: export of unprocessed products (hence little local value additions); under-pricing and unfavourable terms of trade for the highlands; and activities having (uncompensated) backlash effects on mountain areas and communities which exceed the gains to them.

Possible approaches to alter the above features call for deliberate efforts and mechanisms to change prevailing unfavourable terms of trade; realistic resource/product pricing; encouragement to local processing; improving local skills and infrastructure to facilitate the above; and suitable sharing and compensating mechanisms to reduce the adverse impacts of trade on the highlands.

'Managed' and 'semi-managed' natural resource flows

Because of the very nature of landscapes (particularly verticality and slope), the flow of natural resources such as water and nutrients from the highlands to downstream lowlands has been as eternal as the mountains. However, these natural flows became part of managed flows through human efforts to control and regulate the flows for planned downstream use (e.g., water for irrigation, hydropower, and so on).

Additionally, there are semi-managed natural resource flows from the mountains. They include invisible environmental services or gains in terms of groundwater discharge, nutrients, biodiversity elements, silt-free water flows, physical stability of downstream watersheds, and so on which are directly related to conservation and protection of highland watersheds by mountain people. For want of proper economic assessment and lack of pricing, these services involving cost and efforts for the highlands remain uncompensated. Their gains downstream are never shared with the

highlands. In many cases, as in parts of India, downstream farmers do not pay for water for irrigation and electricity generated in the highlands.

The unequal impacts of these natural resource flows would further increase once one considers the backlash effects of managed natural resource flows (through physical structures, and so on) on the economy, sustenance system, and productive habitats of highland communities. Impacts of big dams on local communities are one often-highlighted case.

Another side effect of the specific orientation of lowland-biased management of natural resource flows is the disregard of multiple, locally-beneficial micro-niches, be they small-scale community irrigation systems or micro-hydropower production systems in the hills.

Approaches to altering the situation should focus on multiple fronts. They may include use of environmental/natural resource costing methods to evolve appropriate compensatory (gains sharing) mechanisms for both managed and semi-managed natural resource flows from the highlands to the lowlands and emphasis on small-scale, location-specific works with greater local benefits, little backlash, and improved local linkages and spread effects.

Human resource flows

If one ignores the lowland migrants to the highlands (as in the Chittagong Hill Tracts, or rich people from the plains acquiring summer homes in the hills) and lowland (Bangladesh) salaried workers managing public interventions in the mountains, the seasonal or periodical migration of male adults from mountain areas to the plains is a well-known form of human resource flow. Depending on how one looks at it, its impacts for the highlands are mixed. Besides creating labour scarcity and increasing mountain women's work burden, migration also generates a more regular flow of income for mountain families.

To address the negative aspects of human migration (i.e., to minimise its magnitude and increase its gains through greater earnings for migrants), one needs an integrated approach. First, it requires an alteration of circumstances which force out-migration by creating local employment opportunities through infrastructural development and local resource-based micro-enterprises, and improving local skills and capabilities to benefit from those changes. Improved skills can increase earnings during migration, as skilled migrants can command higher wages.

Social transfers and public sector investment flows

Unlike product and resource flows, the economic flows discussed below are the only major flows that move from the lowlands to the highlands. They consist of: (i) social transfers—e.g., cash and kind supplies like welfare, relief, and subsidies for production and development and (ii) public sector investment and technology flows for development projects.

The outstanding feature of these welfare-cum-development resource flows is that, despite their increase (through foreign aid and national resources), these flows continue to be disproportionately lower compared to both the economic flows from the mountains to the plains and the needs of mountain areas. Consequently, the highlands, besides being net donors to lowland economies, continue to suffer from a state of chronic under-investment with its consequential mounting poverty and underdevelopment.

An equally important feature of public sector investment flows (largely confined to infrastructural developments) is their focus on the areas and locations from which niche opportunities (e.g., irrigation and hydropower, minerals, tourism, forest and horticultural products) are harnessed to meet the lowlands' needs and priorities. Even when development interventions in the highlands are free of a lowlands bias, they lack the mountain perspective, implying a lack of understanding and incorporation of the imperatives of mountain-specific conditions (e.g., fragility, diversity, and so on) in the design and mechanisms of development projects. This reduces the relevance and effectiveness of investment flows to the highlands.

Changes in the above situation require giving a higher priority to highland needs in development investment and designing development strategies with a mountain perspective. A gradual elimination of under-investment should be another priority.

The above discussion largely narrates the dominant situation of highland flows to the lowlands in the past. In the recent period a number of changes have been emerging, as discussed below.

Recent changes

The patterns of highland flows characterising highland–lowland links and their underlying factors, which also promote poverty in most mountain areas, are in the process of change. Accordingly, right from a small country like Nepal to a large country like China, mountain specificities are being slowly addressed. The crucial change is the effort to improve accessibility and promote local capacities in terms of both human resource development (HRD) and promotion of commercialisation and high-value, tradable products.

These changes are particularly important as steps towards linking highlands to lowlands and harnessing the benefits of exchange and trade. To fit well with changes induced by globalisation, new niche products and their processing and marketing, including collaboration with multinational corporations (MNCs), is promoted. China exceeds in these efforts in comparison to other HKH countries. The processes and implications of these trends are discussed in the following section on the repercussions of globalisation for mountain areas, particularly in the context of highland – lowland links and poverty in mountain areas.

ECONOMIC GLOBALISATION: REPERCUSSIONS

Economic globalisation, with primacy given to market-friendly and market-driven processes, provisions, and practices, is spreading to all countries and regions. Although promoted as a means of global growth and prosperity, the process also carries risks for the participants. Participants ill equipped and unprepared for change are likely to encounter more risks and limited gains in the process. Mountain regions like the Himalayas and their communities, due to both their specific biophysical circumstances and historical processes (e.g., chronic under-investment and negative side effects of external interventions) affecting them, fall in this category. The negative side effects of external links may be further accentuated during the globalisation era, due to the well-known tendency of market processes to ignore negative externalities and non-profit concerns, while using and integrating mountain areas into wider economic systems. Besides, due to the rapid erosion of traditional coping strategies of mountain communities in the face of market-driven technological and institutional changes, their inability to participate effectively in the change process, and the reduced economic role and capacity of the state (following market-friendly economic reforms) to extend welfare and development support to them, the communities are likely to be exposed to greater risks and vulnerabilities.

However, at the same time, one need not look at globalisation-led changes in terms of doom and gloom. The process may also generate positive opportunities through harnessing niche resources and products of mountain areas in demand globally and facilitating the flow of resources and technologies to overcome biophysically determined constraints to development in mountain areas. However, realisation of such gains is linked to usable information regarding possible opportunities, enabling facilities, and local capacities to use them.

The above aspects have been discussed in detail elsewhere (Jodha 2002). Drawing from the same source, and supplementing the same by more

exploratory field visits/observations, we discussed the changes with reference to the highland–lowland flows outlined in Table 2.

Emerging changes in trade flows

Regarding negative impacts of globalisation, micro-niche products such as fruit, off-season vegetables, flowers, and so on have been exposed to external competition following trade liberalisation. The comparative advantages of mountain areas endowed by nature in these products are gradually eroding, unless they can be strengthened by man-made support/niche opportunities. The declining gains of fruit like apples, off-season vegetables, and flowers in the Indian Himalayas illustrate this. An important risk emerging from globalisation relates to over-extraction of major niche resources such as timber, minerals, hydropower, and herbs due to increased global demand for these resources and the increased role of markets in decisions about resource exploitation.

On the positive side, globalisation has opened new world markets for unique herbs, mushrooms, other organic products, and NTFPs (non-timber forest products). Enhancing and harvesting these products call for improvements in the capacity of the producers and in state support. In some cases multinational firms have started collaborating in promoting new opportunities, as for example, Dabur, in the case of medicinal herbs in Nepal and India; and Dutch firms helping in floriculture development in the Kunming area of China. Direct or indirect participation of multinational agencies in tourism development in different HKH countries is also taking place.

The involvement of multinational firms in building infrastructure or harnessing major niche resources (water, hydropower, etc.) is also increasing in countries such as Nepal and Pakistan.

Promotion of information technologies and needed infrastructure, again supported by the private sector, is an important development that helps link remote areas with mainstream economies. Though as yet quite limited and faced with problems in terms of logistics, initiatives based on information technology (IT) represent unique opportunities to transform mountain areas, with positive impacts on poverty and fair terms of trade, while linking with the external world.

Managed and semi-managed resource flows

Related to the flows of major niche resources such as timber, minerals, herbs, hydropower, etc., the changes affecting over-extraction of managed and semi-managed resources are another potentially negative repercussion

of globalisation. However, due to increasing awareness of the issues, recognition of the key role of mountain ecosystems in the stability of downstream environments and economies, and mountains being the source of multiple public goods (e.g., biodiversity, freshwater, nutrient flows, and so on), increasing calls for compensating mountain areas and communities are being heard.

The methods to evaluate these resources and services have already been developed by environmental economists. In several developing countries, such as The Philippines, Costa Rica, and Ecuador, lowland agencies have already evolved and implemented mechanisms to compensate highlanders for clean water and other resources available to lowlanders (Koch-Weser 2002).

However, in the HKH region there is no known ready example of this. Although in some cases royalties are paid to the states or counties where highland resources originate, such mountain transfers to the state/county level rarely directly reach the communities which, through their conservation practices, are responsible for generation of environmental resource/service flows.

Social transfer and development resource flows

Apart from royalties, in countries like China and India mountain states and counties get grants from central governments to support welfare and development activities in their respective areas. At times, subsidies or grants are considered as some form of charity, although, in most cases, such resource transfers would fall far short of the resource/service flows from the highlands to the lowlands.

In the context of globalisation and its associated changes, such as macro-economic or structural reforms, the subsidies and free resource transfers (especially at community levels) are likely to disappear due to conditions imposed by the donors. Their impact on the poor will be commented upon shortly.

The specific situation of mountain areas and the mountain areas' contributions in terms of environmental services and supply of public goods, the (World Trade Organisation) WTO provisions on discontinuation of subsidies, and many other factors need to be considered. To this one should add the strong case for compensating the environmental services offered by the highlands. If compensatory provisions are adopted, 'charity oriented' resource flows from lowlands to highlands will not be required. However, advocacy on these issues needs more solid information and analysis to make a strong case.

Human resource flows

The pattern of migration from highlands to lowlands has changed dramatically in recent years. Seasonal and short-term out-migration of unskilled labour is gradually changing into migration involving longer periods, longer distances, and semi-skilled to skilled migrants with higher earnings. The highland workers from Nepal, Pakistan, and other countries migrating to Middle Eastern or South-East Asian countries are one example.

A related aspect of this change is increased remittances to families and countries in foreign exchange. The returning migrants are richer both in money and new skills than they were at the inception and, rather than again living on their fragile or marginal land holdings, they tend either to upgrade the land by irrigation or planting high-value crops, or to move to urban areas and start small enterprises. The latter is a part of slowly emerging commercialisation. Their next generation is better educated and skilled. Field observations in Nepal, India, and Pakistan all support this view.

Impact on poverty

Several issues relating to the implications of changes led by globalisation for rural poverty have already been discussed. The important ones are listed below.

- Loss of nature-endowed comparative advantages to specific products such as horticulture, flowers, off-season vegetables, and so on (due to trade liberalisation as a result of globalisation) directly influence highland farmers.
- Reduced role of the state and unprecedented primacy of markets in economic affairs, leading to decline of social transfers through development subsidy, welfare, and so on have harmed the highland poor most (Jodha 2002).
- Limited skills and capabilities of rural communities to participate in and share the positive gains of globalisation have led to an exclusion process.
- Poor people's other sources and sustenance strategies are also adversely affected by different aspects of globalisation.
- By ignoring customary rights and other arrangements, the governments in different countries—China, India, and Pakistan, in particular—have encouraged private corporations to acquire community and private lands in different areas in the name of development and getting foreign direct investment (FDI).

- Due to market-driven technologies and preferred farm products, the traditional organically integrated farming systems represented by farming–forestry–livestock linkages are gradually disintegrating. The promotion of intensification of agriculture in preference to integrated diversified farming systems is one example of this.
- The socioeconomic changes accentuated by globalisation (such as increased economic stratification; the village rich forming close alliances with distant trading firms and their agents rather than looking at community concerns; the decline of collective risk sharing, and so on) have also reduced the extent and effectiveness of traditional institutional measures to help communities during crises.
- In cases in which community forestry is making good progress, governments are playing with the idea of ‘corporatisation’ (see note to Table 2) of these natural resources and thereby exclude the communities from management and use of local natural resources.

Against the above negative repercussions, at least in the more readily accessible and progressive villages, farmers are able to identify new niche opportunities and harness them by collaborating with the market firms. In some cases, educated rural youth have formed groups to harness such opportunities without involving middlemen. A number of such positive cases was observed in four countries of the HKH during the exploratory study on globalisation and mountains (Jodha 2002).

MAJOR ISSUES AND POLICY IMPLICATIONS

Issue 1

There are common roots of mountain area poverty and unequal highland–lowland linkages, represented by mountain specificities such as fragility, limited accessibility, marginality, and so on.

Policy implications

Policies must address the manifestation and imperatives of mountain features such as:

- fragility by evolving options involving low-intensity land uses (e.g., high-value herbs; zero-tillage systems, and ‘green’ roads suited to fragile slopes); and
- the need to upgrade marginal resources through irrigation, access, and conservation technologies and socioeconomic demarginalisation by local capacity building; decentralisation, and participatory interventions.

Issue 2

Analysis of resource, product, and service flows can help to understand highland–lowland linkages in order to evolve approaches to enhance their equity and complementarity.

Policy Implications

- Emphasise enhanced research efforts to refine and operationalise the framework, including methodologies to deal with specific product flows and contexts.
- The framework, supported by data and analysis, can help in advocacy for appropriate pricing of resource flows and compensation for environmental services.
- The immediate steps to influence the extent and equity of the above flows should include building infrastructure and local capacity (in terms of growth of enterprise and commercialisation).

Issue 3

Economic globalisation is emerging as a major influence on both mountain poverty and on highland–lowland linkages. This carries both risks and opportunities manifested by negative and positive impacts on all the resource-product flows outlined in this paper.

Policy implications

Broadly speaking, the flow-based analysis of repercussions of globalisation can help to identify response strategies to minimise the risks and enhance or harness opportunities associated with globalisation. This needs increased situation/flow-specific research.

Issue 4

Specific problems emerging in the context of globalisation and related developments include:

- reduced comparative advantage to some mountain products due to liberalised trade policies;
- reduced state support to the poor and breakdown of the social safety net;
- declining local access to local natural resources; and
- persistent and accentuated natural resource extraction due to rising global demands.

Policy implications

These and other related issues should be addressed through:

- greater attention to supplementing natural niche by man-made niche (facilities) in mountain areas;
- involvement of local communities in decisions affecting them; and
- search for and promoting 'exception' windows in WTO provisions to protect mountain natural resources, to compensate for their environmental services, and to provide special provisions to help the mountain poor.

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