



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

PRESIDENTIAL ADDRESS*

**Mountain Agriculture: Development
Policies and Perspectives**

Narpat S. Jodha[†]

I

INTRODUCTION AND THEMATIC FRAMEWORK

This paper deals with agricultural development and policies in mountains and hills in the Himalayan Region. It is based on the synthesis of information and understanding acquired through over two decades of my work at International Centre for Integrated Mountain Development (ICIMOD) an institution mandated to work in eight countries of Hindu Kush Himalayas (HKH Region), namely, Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal and Pakistan. In India eleven states namely, Arunachal Pradesh, Assam, Himachal Pradesh, Jammu and Kashmir, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura and Uttarakhand (plus Darjeeling district of West Bengal), with total population of 1132 million, fall under the mandated work area of ICIMOD.

Mountain agriculture (instead of being confined to field crops as in the case of the prime land in plains) is an integrated system of resource usage, linking various land-based activities. As a result, the links between the agricultural and environmental processes, their disruptions and consequences, are more clearly visible in mountain areas compared to many other agro-ecosystems. Hence we look at mountain agriculture through the lens of environmental resources management and sustainability.

Since the above issues have by and large not drawn the attention of development planners and policy makers, we also address these aspects under the title 'Mountain development without mountain perspective'. Here agricultural processes are seen through the general development process in mountain areas. Since this 'missing mountain perspective' also distorts our understanding of the implications of and approaches to emerging changes in mountain areas, such as those related to economic globalisation, climate change, etc., we also allude to these emerging changes. Finally, the inferences from the above discussion are also seen in terms of future prospects for agriculture and mountain areas and communities in general.

*Presidential Address delivered at the 68th Annual Conference of the Indian Society of Agricultural Economics, held on November 28, 2008 at Andhra University, Visakhapatnam.

[†] Sr. Associate Scientist, International Centre for Integrated Mountain Development, Kathmandu, Nepal.

II

MOUNTAIN CONTEXT: MOUNTAIN SPECIFICITIES

Mountain agriculture is broadly defined as covering all land based activities such as cropping, animal husbandry, horticulture, forestry, etc., as well as water harvesting and a variety of conservation practices. Owing to their organic and functional linkages, created and reinforced through biophysical features of mountain areas and harnessed by resource users, the above activities cannot be meaningfully segregated and sustainably managed in a sectoral mode. Viewed this way, mountain agriculture not only constitute a major occupation and source of sustenance for the bulk of the mountain population, but also represents a primary form of natural resource use in mountain areas of developing countries, including India. If externally designed and operated activities such as mining, hydropower production, commercial plantations are excluded, the pace and patterns of the overall natural resource use in mountain areas would not be very different from those of agricultural land use (Jodha *et al.*, 1992). Hence, we use, the terms mountain resource use and agricultural resource use, interchangeably in this discussion.

The performance as well as the pace and pattern of transformation of mountain agriculture is conditioned and shaped by the biophysical features of mountain areas and the human ability to adapt to them. These inter-related mountain features, termed as mountain specificities include inaccessibility (or restricted accessibility), fragility, marginality, diversity, niche and specific human adaptation mechanism to the above features. Many of the above features are not only interlinked (in impacts etc.) but have social dimensions as well. Within the mountains their extent varies in different mountain landscapes. These features create objective circumstances, which in turn present a range of opportunities and constraints for agriculture, and influence human responses to them. Their operational implications are elaborated elsewhere (Jodha 1990, Jodha *et al.*, 1992), and summarised in Table 1.

TABLE 1. MOUNTAIN SPECIFICITIES AND THEIR IMPERATIVES

(1)	(2)
1A. Limited Accessibility	
(a) Product of	<ul style="list-style-type: none"> Slope, altitude, terrain conditions, seasonal hazards, etc. (and lack of prior investment to overcome them).
(b) Manifestations and implications	<ul style="list-style-type: none"> Isolation, remoteness semi-closedness, poor mobility. High cost of mobility, infrastructural logistics, support systems, and production/exchange activities. Limited access to, and dependability on, external support (products, inputs, resources). Detrimental to harnessing niche and gains from trade; invisibility of problems/potentials to policy makers. Local resource centred, diversified production/consumption activities.

(Contd.)

TABLE 1. (CONTD.)

(1)	(2)
(c) Imperatives (appropriate responses)	<ul style="list-style-type: none"> Local resource regeneration, protection, regulated use, recycling. Focus on low-weight/volume and high value products for trade. Nature and scale of operations as permitted by the degree of mobility and local resource availability. Development interventions with a focus on: <ul style="list-style-type: none"> Decentralisation and local participation: inaccessibility reduction with sensitivity to other mountain conditions (e.g. fragility), changed development norms and investment yardsticks.
1B. Fragility and Marginality	
(a) Product of	<ul style="list-style-type: none"> Combined operations of slope/altitude, and geologic, edaphic, and biotic factors; biophysical constraints create socio-economic marginality.
(b) Manifestations and implications	<ul style="list-style-type: none"> Resources highly vulnerable to rapid degradation, unsuited to high intensity/productivity uses: low carrying capacity, low input absorption. Limited, low productivity, high risk production options: little surplus generation or reinvestment. High overhead cost of resource use: obstacles to infrastructural development, under-investment, subsistence orientation of economy. People's low resource capacity preventing use of high cost, high productivity options; disregarded by 'mainstream' societies.
(c) Imperatives (appropriate responses)	<ul style="list-style-type: none"> Resource upgrading and usage regulation (e.g. by terracing), community sanctions. Diversification involving a mix of high and low intensity land uses, a mix of production and conservation measures, low cost, local resource use. Local resource regeneration, recycling, regulated use, dependence on nature's regenerative processes, and collective measures. Different norms for investment to take care of high overhead costs.
1C. Diversity	
(a) Products of	<ul style="list-style-type: none"> Interactions between different factors ranging from elevation and altitude to geologic and edaphic conditions, as well as biological and human adaptations to them.
(b) Manifestations and implications	<ul style="list-style-type: none"> A basis for spatially and temporally diversified and interlinked activities, heterogeneity-induced strong location specificity of production and consumption activities. Limited applicability of activities meant for wider application, and limits to scale-associated benefits. Territorial diagnosis followed by diversified interventions and decentralised arrangements (technologies, infrastructure, and institutions).
(c) Imperatives (appropriate responses)	<ul style="list-style-type: none"> Small scale, interlinked diversified production/consumption activities: temporally and/or spatially differentiated activities for fuller use of environment. Location-specific integrated, multiple activities with a focus on performance of total production system.
1D. 'Niche' Opportunities	
(a) Product of	<ul style="list-style-type: none"> Unique environment and resource characteristics of biophysical conditions (people's traditional practices for adaptation to specific mountain conditions also part of 'niche').

(Contd.)

TABLE 1. (CONCLD.)

(1)	(2)
(b) Manifestations and implications	<ul style="list-style-type: none"> • Potential for unique products/activities (hydropower production, tourism, horticulture, timber, medicinal herbs, indigenous knowledge systems etc.), with significant comparative advantages to mountain areas. • The bulk of the potential remains under-utilized for want of resources and infrastructure (or selective over-extraction by external agencies).
(c) Imperatives (appropriate responses)	<ul style="list-style-type: none"> • Harnessing of 'niche' integral part of diversified resource use, using the rationale of traditional systems, modern science and technology, infrastructural support and local participation.

Source: Table adapted from Jodha (1997), based on evidence and inference from over 20 studies from mountain areas of different countries, referred by Jodha and Shrestha (1994). It indicates (a) the bio-physical foundations of mountain specificities, (b) their manifestations and implications seen as objective circumstances; and (c) the latter's imperatives in terms of appropriate responses to manage the above features (e.g. through choices and methods of resource use including nature and type of development interventions. ICIMOD has identified and helped promote good practices or success stories for agricultural and rural development using this framework (Jodha and Shrestha, 1994), ICIMOD.

III

IMPLICATIONS FOR AGRICULTURAL PERFORMANCE AND TRANSFORMATION

With some exceptions such as Himachal Pradesh and a few pockets in other mountain states in India, mountain areas and agriculture are among the subjects neglected by development planners in India as well as other countries in the HKH region. This is the situation despite efforts and investment earmarked for mountain areas (including almost 100 per cent central assistance to most of India's mountain states as grant). The primary reason for neglect or ineffective development interventions is the designing and implementing of the interventions without mountain perspectives, i.e., with little understanding or incorporation of imperatives of mountain specificities in development interventions including through extension of plain based inappropriate experiences and models to mountain areas. Regarding mountain agriculture, the understanding of mountain specificities and their imperatives can help identify the opportunities and constraints to guide the development interventions. This could be explained through juxtaposition of the imperatives of mountain specificities with the conditions historically associated with high performance of agriculture (e.g., farming in the prime lands). This can more sharply project the implications of the mountain conditions for agricultural performance and development, and the possible steps to address the same. The details in Table 2 provide an indicative picture of the generalised situation.

According to the table the mountain conditions tend to limit: (a) Capacity of the agricultural systems to absorb inputs, (b) Scope for resource use intensification and upgrading (transformation) through infrastructure development, (c) Production opportunities and gains associated with the scale of production systems (similar to green revolution in the plains), (d) Exposure to and replicability of development strategies from plains; (e) generation of surplus and its exchange at favourable terms of trade.

TABLE 2. MOUNTAIN SPECIFICITIES AND THE CONDITIONS OF HIGH AGRICULTURAL PERFORMANCE

Mountain specificities – generated constraints and opportunities for agriculture (1)	Conditions associated with high performance - Agriculture					
	Production enhancing factors				Abilities to link with wider systems	
	Resource use intensity (2)	Input absorption capacity (3)	Infrastructure (4)	Scale economies (5)	Surplus generation/ trade (6)	Replicating external experience (technology etc.) (7)
Limited Accessibility: Distance, semi- closedness, high cost of mobility and operational logistics, low dependability of external support or supplies.	(-) ^a	(-)	(-)	(-)	(-)	(-)
Fragility: Vulnerable to degradation with intensity of use, limited low productivity/pay- off options.	(-)	(-)	(-)	(-)	(-)	(-)
Marginality: Limited, low pay-off options, resource scarcities and uncertainties, cut-off from the 'mainstream'.		(-)	(-)	(-)	(-)	(-)
Diversity: High location specificity, potential for temporally and spatially inter- linked diversified products/activities.	(+) ^a	(+)	(-)	(-)	(+)	(-)
Niche: Potential for numerous, unique products/activities requiring capacities to harness them.	(+)	(+)	(-)	(+)	(+)	(+)
Human Adaptation Mechanisms: Traditional resource management practices – folk agronomy, diversification, recycling, demand rationing, etc.	(+)	(+)	(-)	(-)	(-)	(+)

Source: Adapted from Jodha (1990, 1997).

a: (-) and (+) respectively indicate extremely limited and potentially, relatively higher degree of convergence between imperatives of mountain conditions and the conditions associated with high performance of agriculture. The constraints indicated for the primary production sector (e.g., agriculture), also apply to the secondary and tertiary sector activities, such as product processing and marketing.

The circumstances created by restricted accessibility, fragility, marginality, (and to an extent diversity in some contexts) are the primary source of the above limitations.

At the same time, as indicated by Table 2, diversity, niche, and people's capacities to adapt to objective situations also have potential which, if properly harnessed through diversified location-specific strategies, can help satisfy some of the basic conditions associated with high performance agriculture in different parts of the world.

IV

INFERENCES: THE BASIC QUESTION AND SOME ANSWERS

The important inferences from Table 2 raise the following questions for development planners and policy makers dealing with problems of agriculture as well as development in general in mountain regions.

- (1) In view of fragility, marginality and to an extent restricted accessibility, how to enhance the use-intensity and (physical and economic) input absorption capacity of land without negative side effects that lead to resource degradation?
- (2) How to evolve approaches and options (a) for harnessing niche and potential of diversities without side effects leading to resource degradation; (b) ensure high productivity despite low land use intensity and low input regimes (particularly external inputs); and (c) cope with periodic shocks (scarcities/floods/droughts) and rising pressure on fragile resources?
- (3) What are the forms and patterns of external linkages and how are they to be developed (in keeping with local gains and capacities) to ensure accomplishment of potential options under (1) and (2) above.

Often people search for answers to encountered problems in history as well as contemporary/emerging circumstances (Allan *et al.*, 1988; Davis, 1991). We may follow the same approach by exploring the past and current experience of the state and society in dealing with the above or related issues in the mountain context. This will be followed by a brief search for potential options in the complex of current and emerging changes. An attempt is made in macro and micro level contexts.

(A) *Situation at Macro-Levels*

Macro-level responses to a number of key issues covered by the above questions include the following:

The first and foremost issue relates to state policies and programmes for mountain areas. As alluded to earlier, even if one ignores the general neglects of mountain areas (except for exploiting mountain niche resources for mainstream economies), public intervention in mountain areas did not have mountain perspective, where from most of the above questions emerged.

- This is illustrated by transfer of development approaches and experiences evolved for non-mountain area to mountain areas, be it the technological options or institutional interventions (Jodha and Shrestha 1994; Jodha, 1997).
- The state policies and programmes have been quite aware of the niche resources/products of mountain areas. But the same resources, e.g., clean water for hydro-power or irrigation, timber, minerals etc. are harnessed (often over-exploited) for the downstream/mainstream economy with limited gains for mountain areas.
- Besides the above major niche even the minor niche products (e.g. horticultural products) are marketed to plains at unfavourable terms of trade.
- The limited exchange links and unfavourable terms of trade are a consequence of unequal highland low land links that result from both physical and social inaccessibility, marginality, fragility etc. (Jodha, 2000b), which the state interventions have rarely addressed except where exploitation of niche resources, linking of major towns and considerations of border defense are involved.
- The persistent lack of connectivity and market links compel rural mountain communities to remain subsistence-oriented and poor. In some areas where the interventions have been in keeping with mountain perspective, the above constraints have been lessened and the economies of the mountain communities have been transformed (Jodha, 1997; Jodha and Shrestha, 1994; Chand, 2000).

(B) Micro-Level Responses

Compared to the macro-level situation, a greater range of answers to the above mentioned questions can be found in the community level approaches and practices dealing with agriculture and overall natural resource management.

As revealed by ICIMOD's field studies in different countries of HKH including some hill states of India, and some other studies, the farmers and rural communities in mountain areas have evolved and used several adaptation measures to address the imperatives of mountain specificities. (Jodha *et al.*, 1992; Jodha and Partap 1993; Sanwal, 1989).

At the same time it should be noted that many of these folk-technological and informal institutional measures and practices have been marginalised following the recent changes such as enhanced integration of mountain areas with non-mountain mainstream regions at the latter's terms. The increased market and public interventions have undoubtedly helped the mountain areas (such as through improved roads and communication infrastructure as well as other associated facilities), but haven't been without negative side effects due to their missing mountain perspective (Jodha, 2005a).

Table 3 which is quite self explanatory, summarises the key features of the said adaptations and their marginalisation under the changed circumstances. The inferences drawn from Table 3 can help identify some elements of the adaptations, which could be integrated with policy programme approaches to facilitate sustainable development of mountain agriculture.

TABLE 3. MEASURES DIRECTED TO MANAGE CONSTRAINTS AND OPPORTUNITIES UNDER TRADITIONAL AND PRESENT DAY AGRICULTURE IN MOUNTAIN AREAS

Measures Adopted	
Traditional farming systems (1)	Present day farming systems including development interventions (2)
A. Enhancement of Use Intensity/Input Absorption Capacity of Land	
Small scale, location-specific, community oriented/supported resource amendments using ethno-engineering measures; terracing/ridging/drainage management, community irrigation, agro-forestry, etc.; their reduced feasibility with rising pressure on land, weakening of local level collective arrangements, external impositions.	Weakened traditional measures, supplemented/substituted by selected, larger scale resource upgrading (e.g. irrigation, infrastructure, watershed development) designed and implemented by external support; use of modern science and technology, and public subsidy; a number of social and environmental side effects of change.
B. Usage and Management of Low Use Capability Lands	
Diversified, interlinked, land-based activities; folk agronomy involving measures with low land intensity and low (local and affordable) input regimes; integration of low intensity-high intensity land uses (based on annual-perennial plants, crop-fallow rotations, slash and burn, indigenous agro-forestry, common property resources) social sanctions for resource-use regulations; conservation; migration/transhumance.	Compelled by increased population and land shortage, rapid increase in indiscriminate intensification of land use; sectorally separated production programmes; high intensity uses promoted through new technology inputs/incentives or subsidies; limited conservation-oriented initiatives (forests/pastures/watersheds), operated largely in project mode.
C. Options to Harness Diversity and Niche	
Folk agronomy – diversified cropping, focus on multiple use species; complementarity of cropping – livestock/forestry/horticulture; emphasis on biomass in choice of land-use and cropping patterns; complementarity of spatially/temporally differentiated land-based activities; stability-oriented, location-specific choices; harnessing niches for tradable surplus.	Reduced diversification and narrowed focus on cropping driven by: (i) subsistence needs (e.g. in the case of food crops); (ii) commercialisation (as in horticulture); and (iii) public interventions; sectorally segregated programmes and their support systems (R&D, input supplies, crop marketing), focus on selected species and selected attributes (e.g. monoculture, high grain; stalk ratio); extension of generalised development experience of plains with high subsidy.

(Contd.,)

TABLE 3. (CONCLD.)

Measures Adopted	
Traditional Farming Systems (1)	Present Day Farming Systems Including Development Interventions (2)
D. Managing Isolation, External Links and Demand Pressure	
Living with general state of relative inaccessibility and isolation from mainstream market; limited linkages through tradable surplus from harnessing niche; scarcity period-external dependence through transhumance, migration, and remittance economy; insignificant surpluses, but petty trade in niche-based products. Subsistence strategies focused on diversification and linkages of land-based activities; flexibility in scale, operations, or input use; local renewable resources, recycling or inputs/products, self-provisioning; crisis period collective sharing arrangements, social regulations for rationed use and protection of fragile resources; release of periodic/seasonal pressure by migration, transhumance, remittance economy; emphasis on managing 'demand'.	Reduced risks of isolation due to improved physical and market linkages; integration of mountain economy with other systems; highly uneven, but improved opportunities for relaxing internal constraints through technology, resource transfer, interactions with other systems; inducement for fuller use of niche through external demand; closer integration with mainstream. Reduced sole dependence on local resources, due to public relief and support during crisis/scarcities; public interventions replacing traditional self-help strategies and informal regulatory measures; decline of resource regenerative, recycling practices. Increased dependency for subsistence on external resources; encouragement for perpetual growth of pressure on fragile resources; indifference to local self-help initiative.

Source: Based on evidence and inferences from over twenty studies cited in Jodha and Shrestha (1994), Jodha (1997).

V

THE POLICY CHALLENGES AND APPROACHES

The task of identification of the present day functional substitute of relevant traditional measures can be initiated at different levels such as at the community level NGO activities, agricultural R&D, etc. However, such processes need to be led by reorientation of approaches and thinking at the policy levels. To facilitate this process, the questions listed above need to be formulated differently, so as to serve as focused issues for a well designed policy agenda to promote agricultural development based on mountain perspective. Such reformulation of policy issues is based on the premise that the nature and extent of the constraints and opportunities generated by mountain specificities tend to change with the changes in man made circumstances. The latter includes developments like enhanced physical and market integration of mountain and plains as well as selective over extraction of mountain niche; the emerging global trends affecting the future of mountain resources, products and people; global concern for protecting mountain ecosystems and associated lobbies; widening gap between relatively better endowed, accessible areas and remote areas within the mountain regions; rising local consciousness and community mobilisation through NGOs and others in mountain areas to enhance voice and visibility of mountain communities; combined impacts of population changes, public interventions and market penetration disrupting the delicate balance between supplies and demand affecting people's livelihood in mountains. These and some related

developments have further reinforced the need for sensitising agricultural policies and programmes to mountain specificities. However, in the light of the above changes, the imperative of details presented under Table 2, (in terms of new constraints and opportunities) need to be reinterpreted. This will facilitate identification of important issues for policy focus (ICIMOD, 2006). In the following discussion we briefly indicate such issues, though most of them are closely interlinked. Furthermore, all of them are rooted in the imperatives of mountain specificities.

VI

RESPONDING TO EMERGING TRENDS AND DEVELOPMENT THRUSTS

In order to respond to the reformulated questions, it will be useful to put the positive and negative imperatives of mountain conditions as part of broader issues and approaches comprising the national and global discourses and initiatives, and translate them in the mountain context. In more concrete terms one can think of issues and approaches as detailed below.

(i) Poverty Alleviation: Gaps and Fresh Opportunities

The final consequence of limited accessibility, fragility, marginality of mountain areas is the persistent poverty. Global initiatives such as Millennium Development Goals, Millennium Ecosystem Assessment, Global Climate Change, Economic Globalisation, Global Mountain Partnerships, etc., provide the broad framework to address poverty, livelihoods and sustainability issues in mountain areas. The above initiatives have several imperatives and provisions that directly or indirectly address the poverty-promoting processes and their control measures. Alleviation of poverty in mountain areas can qualify as an important place in this process. This calls for enhanced awareness and advocacy efforts. On the action front, enhanced connectivity through physical infrastructure and other means of communication should be the high priority task. This is an important first step towards linking location-specific activities and products to market, which can help in generating multiple productive opportunities and gains from exchange including through equitable highland-lowland links (Papola, 1998; Partap, 1998).

To respond to fragility (slope) led constraints and high cost of infrastructure, e.g., roads development, the efforts should focus on location-specific situations such as rural roads, donkey tracks, gravity ropeways, suspension bridges, etc. I.T. based communications are already picking up as an important means connecting mountain areas internally and externally. This has helped in market links of different mountain areas to mainstream economies.

(ii) *Handling Social Marginality*

If the social marginality is not addressed and de-marginalised, it has a tendency to become a threat to overall social stability and normal processes of the socio-economic systems. The emergence of insurgencies and violent protests in many parts of Himalayas partly reflects this. Hence a need arises for inclusive policies and programmes. During the last two decades or so through special programmes for poor and vulnerable groups, enhanced awareness and capacity building the voice and concerns of the marginal groups is increasingly recognised. However, the processes of social mobilisation, protection of indigenous people's rights and practices, etc., being addressed now have to be accelerated. This also needs bottom up approaches to address these issues. Enhanced accessibility and linkages with mainstream societies along with sound economic footing need to be emphasised in this context. However, their negative side effects have to be guarded against.

(iii) *Productive Use of Fragile Slopes and Marginal Lands*

Landscapes characterised by the above features are not as productive as lands in plains or mountain valleys, but they do have potential for specific products such as mountain herbs, space for grazing and growing of some hardy crops. In the context of demand for organic products supported by enhanced connectivity, such lands can contribute to the farmers' incomes considerably. Besides, some micro-enterprises such as honey bee, small scale poultry, stall fed goat keeping etc. can be sustained through such lands. More importantly, rather than using these lands as they are, there could be more options to enhance their production potential, through upgrading such lands by provision of irrigation including through local water harvesting, linking them to their product markets (for fair product prices) through rural roads, etc. Focused agricultural R&D can help make them more productive through new technologies for marginal and slopy lands. The emerging concern of payment for environmental/ecological services can also add to their contributions (Jodha, 2000a; b).

(iv) *Diversified Farming Systems*

Diversities of varying degrees and at different levels has been a dominant feature of mountain landscapes. Traditionally mountain farmers have been harnessing its gains through various spatial and temporal combination of crops and other activities linked to livestock, farm forestry etc. Looking to the emerging new market opportunities as well as new production and processing technologies, the options to enhance and harness the options through diversified farming and over all land use systems have increased significantly. Through appropriate policies and support systems diversified farming systems could be one of the major engines of

transformation of mountain agriculture. Already several donors, NGOs and public agencies are promoting this.

(v) Niche Focused Development

As discussed earlier, the selective harnessing of mountain niche has been the part of public policies towards mountain resource use. However, in the process the micro-niche (especially the agricultural products) has seldom got sufficient attention except for products like tea, coffee and some fruits.

The emerging trends such as improved connectivity, market links and micro-enterprise development, etc., have increased the visibility and importance of wider range of mountain niche products. However, to enhance the process and role of niche-based options in mountain development, the policy programme support should be emphasised. Currently globally emphasised value chain approaches can be one important lead driver for the effective promotion of the approach suggested above. The only risk in indiscriminately pushing this approach is that 'value adding chain' approaches focus on the selectively market demanded products. Over promotion of such options may lead to backlash on the other products which are part of diversified production systems in mountain areas.

(vi) Equitable Highland-Lowland Economic Links

The potential approaches and gains associated with diversified production systems and niche-centred development are very closely linked to the nature and type of highland-lowland economic links. As discussed earlier, at present these links are unequal and unfavourable to mountain areas. The unequal links are responsible for the domination of uncompensated or underpriced flow of mountain resources and products to low lands. The improved accessibility can help make such links equitable. However, more than this the public policies directed to local physical and institutional infrastructure, human capacity building, etc. are equally important to ensure equitable links and their benefits to mountain producers (Jodha, 2000b). More importantly, in the changing economic and environmental situations including climate change in a greater need for harmonious mountain-plain links with mountains' role as source of fresh water and rich biodiversity hardly needs mention.

(vii) Globalisation Context: Risks and Opportunities

As mentioned earlier the conventional development intervention in mountain areas including those for mountain agriculture, despite good intentions, have remained insensitive to mountain specific circumstances caused by inaccessibility, marginality etc. These conditions have led to invisibility of mountain realities to the national policy makers. The same may apply to global initiatives, where

decisions/actions on behalf of mountain areas/communities are made without their knowledge and participation. This may apply to promotion of globalisation processes in the mountain context. More importantly, there are visible incompatibilities between the imperatives of mountain specificities (such as appropriateness of diversified production systems) on the one hand and features of globalisation process (e.g., focus selectivity and narrow specialisation) on the other. These contradictions are not conducive to integrated and sustainable development of mountain agriculture. Furthermore, globalisation supports the clever and smart farmers while mountain farmers are simple and ignorant about complex market processes. Hence, they face more risks. To handle these incompatibilities special efforts to build local capabilities, etc., need special attention (Jodha, 2005b).

REFERENCES

- Allan, N.J.R.; G.W. Khapp and C. Stadel (Eds.) (1988), *Human Impacts on Mountains*, Rowman and Littlefield, New Jersey.
- Chand, R. (2000), "Agricultural Development, Growth and Poverty in India's Mountain Region", in M. Banskota, T.S. Papola, J. Richter (Eds.) (2000), *Growth, Poverty Alleviation and Sustainable Resource Management in Mountain Areas of South Asia* ICIMOD (Kathmandu) and Food and Agriculture Development Centre (GTZ), Feldafing (Germany).
- Davis, S. (1991), *Indigenous Views of Land and Environment*, The World Bank, Washington, D.C., U.S.A.
- ICIMOD (2006), *Achievements, Challenges and Lessons Learned*, International Centre for Integrated Mountain Development, Kathmandu.
- Jodha, N.S. (1990), "Mountain Agriculture: The Search for Sustainability", *Journal of Farming Systems Research Extension*, Vol.1, No.4, pp. 55-75.
- Jodha, N.S. (1997), "Mountain Agriculture", in B. Messerli and J.D. Ives, (Eds.) (1997), *Mountains of the World: A Global Priority*, The Parthenon Publishing Group, London, U.K.
- Jodha, N.S. (2000a), "Globalisation and Fragile Mountain Environments: Policy Challenges and Choices", *Mountain Research and Development*, Vol. 20, No. 4, pp. 296-299.
- Jodha, N.S. (2000b), "Poverty Alleviation and Sustainable Development in Mountain Areas: Role of Highland-lowland Links in the Context of Rapid Globalisation", in M. Banskota, T.S. Papola and J. Richter (Eds.) (2000), *op.cit.*
- Jodha, N.S. (2005a), "Adaptation Strategies Against Growing Environmental and Social Vulnerabilities in Mountain Areas", *Himalayan Journal of Sciences*, Vol. 3, No. 5, pp. 33-42.
- Jodha, N.S. (2005b), "Economic Globalisation and Its Repercussions for Fragile Mountains and Communities in Himalayas", in U.M. Huber, K.M. Harld, K.M. Bugmann, M.A. Reasoner and Springer Dordrecht (Eds.) (2005), *Global Change and Mountain Regions: An Overview of Current Knowledge*, The Netherlands.
- Jodha, N.S. and T. Partap (1993), "Folk Agronomy in Himalayas: Implications for Agricultural Research and Extension", in *Rural People's Knowledge Agricultural Research and Extension Practices*, IIED Research Series Vol. 1. No. 3, International Institute for Environment and Development (IIED): London, U.K.
- Jodha, N.S. and S. Shrestha (1994), "Sustainable and More Productive Mountain Agriculture", in *Proceeding of International Symposium on Mountain Environment and Development*, ICIMOD, Kathmandu.

- Jodha, N.S.; M. Banskota and T. Partap (Eds.) (1992), *Sustainable Mountain Agriculture*, Vol. I Perspectives and Issues, Vol. III Farmers' Strategies and Innovative Approaches, Oxford & IBH Publishing Co., New Delhi.
- Papola, T.S. (1998), High Value Enterprises for Sustainable Livelihoods: Trends, Experiences and Policies in the Hindu Kush-Himalayan Region, Paper presented at the Conference on Mountain 2000 and Beyond, Wildbad, Kreuth, FR Germany.
- Partap, T. (1998), "Crop Productive and Sustainability: Shaping the Future", in V.L. Chopra, R.B. Singh and A. Verma (Eds.) (1998), *Proceedings of the 2nd International Crop Science Congress*, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
- Sanwal, M. (1989), "What We Know About Mountain Development: Common Property, Investment Priorities and Institutional Arrangements", *Mountain Research and Development*, Vol. 9, No. 1, pp.3-14.