

Keynote Speech

Highland Agriculture as Peasant Perseverance

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In 1988, ICIMOD initiated problem-oriented research on mountain farming systems in selected areas of the Hindu Kush-Himalayas. This work, done in collaboration with national agencies and experts from the region, involved review of agricultural policies and programmes; and site-specific studies on crops, livestock, horticulture, technology, and rural institutions. The findings of this regional exercise were discussed during the International Symposium on Strategies for Sustainable Mountain Agriculture in 1990 (Jodha, Banskota and Partap 1992). The present symposium can be taken as a follow-up of that meeting to assess the progress made over the last decade.

Terminological Traverse

Our main objective at this International Symposium on Mountain Agriculture in the HKH is to share information and knowledge, and to exchange views on emerging problems and opportunities for development. Our communication will be better if we agree on some terminology at the outset, so I will start by clarifying some terms common in discussions of mountain development. The terms I cite fall into three categories: superfluous adjectives, conceptual fallacies, and spurious designations.

Take the buzzwords 'integrated development' and 'sustainable development'. The burden of 'integrated' was invented in the 1970s and that of 'sustainable' in the 1980s. If one reflects on the meaning of development as 'to cause to become better, more complete, or more advanced', it becomes clear that these terms are merely notional and superfluous. Can there be any intervention to affect such a development without the linkage of systems and sectors? The term 'integrated' as an adjunct to 'development' is mere jargon for a coordinated approach. If there is such a thing as 'sustainable development', one also has to assume the existence of 'unsustainable development'. This helps to clarify the distinction between *intrinsic development* (the former) and *linear growth* (the latter). A development process based on structural change with a propelling mechanism does not need a superfluous adjective that means the same thing. Any 'development' implies an integrated approach and sustainable objective.

The phrase 'fragile mountain' came into currency in 1976. It does highlight the environmental problems of mountain areas, but has the element of exaggeration. Seen on a geologic time scale, the mountain represents a dramatic intermediary stage between the plain (its orogenic womb) and the plateau (its senile form). In terms of geomorphic processes, mountain and hill ranges are outliers of extreme resistance against the gravitational pull. Excessive exposure to natural elements makes mountains a high energy area for mass wasting. Therefore, it would be more realistic to consider mountains as dynamic (Gurung 1987), but certainly not fragile.

Agricultural geography pertains particularly to places that have conventional designations. In Nepal, there are specific native terms for various elevation zones. Yet, so-called scientific endeavours tend to distort them. An FAO/HMGN/UNDP (1980) inventory on watersheds devised five major ecological units for Nepal (Table 1). These were: (1) high Himalaya, (2) transition zone, (3) middle mountain, (4) 'Siwalik', and (5) 'Terai'. Subsequently, another investigation on land systems in Nepal adopted these categories as physiographic regions, although relief forms cannot necessarily be equated with ecological expressions (Kenting Earth Sciences 1987). This is evident from the incongruity of the Land Resource Mapping Project's (LRMP's) 'high mountain' with FAO/HMGN/UNDP's 'transition zone', which actually pertains to areas of deep gorges and valleys. The distinction between Himalaya (1) and mountain (2) is spurious, while the adjective 'high' is equally superfluous to both. The middle mountain (3) actually refers to the conventionally recognised hill region (Table 1). The Siwalik (4) is actually a geological term for the sub-Himalayan foothills. There is no confusion with regard to the Terai (or Tarai) designation for the plains. This scientific obfuscation may be contrasted with native appreciation of their own landscape. In Nepal elevation zones are designated in relation to snow: 'pahar' (no snow), 'lekh' (winter snow), and 'himal' (permanent snow). Furthermore, names for similar landforms vary regionally: the inner Terai is called 'dun' in the west, 'madhi' in central Nepal, and 'khonch' in the east. I have made this terminological digression because agriculture is intimately tied to land, the scientific analysis of which can be enriched with indigenous knowledge.

Table 1: Nepal: elevation zones

Relief feature (Local term)	Ecological unit (FAO/HMG/ UNDP)	Physiographic region (LRMP)	Geographic zone	Main crops and livestock
1. Trans-Himalaya ¹ (bhot) 2. Himalayan Axis (himal)	High Himalaya	High Himalaya	Mountain	barley, buckwheat, potato, sheep, goat, yak
3. Elevated Spurs (lekh) 4. Hill Complex (pahar)	Transition Zone Middle Mountain	Middle Mountain	Hill	maize, millet, sheep, goat, cattle
5. Dun Valleys (bhritri madhesh) 6. Foothills (churia)	Siwalik	Siwalik	Inner Terai	mustard, cattle
7. Plains (Terai)	Terai	Terai	Terai	paddy, cattle

¹West of Ganesh Himal (Longitude 85°E)

Highland Agriculture

Since the Hindu Kush-Himalayas are a composite of various elevation zones that have distinctive ecologies, I prefer the term 'highland' to encompass their spectrum. In the case of Nepal, corresponding to the central Himalayas, these broad divisions are (1) temperate Himalayas, (2) sub-tropical hill, and (3) tropical inner Terai enclosed by foothills. Their agricultural zonation is reflected by indicator crops and livestock (Table 1). Yet, elevation is only one dimension of highland environment. Troll (1967) provides a three-dimensional landscape division of the Himalayan system as: (a) vertical gradation (altitude), (b) from south to north (latitude), and (c) east-west asymmetry (longitude). Rhoades (1992) suggests an overlay of 'human culture' as a fourth dimension over the three geo-ecological ones. The suggested cultural dimension has to do with type of technology. According to the ICIMOD research framework, mountain agriculture includes all land-based activities such as cropping, animal husbandry, horticulture, and forestry. A crop-dominated farming system is dominant in the lower zone, a livestock-dominated system

in the higher zone, and in-between there are horticulture and mixed systems. These idealised models are modified by the climatic asymmetry between the arid north-west and the humid south-east. Thus, the typology of agricultural system varies both vertically and horizontally across the HKH region (Table 2). Beginning with the north-south vertical contrast, animal husbandry is dominant in the trans-Himalaya and temperate mountains. Agro-pastoralism is prevalent in the sub-tropical hills. Cereal cultivation increases in importance with decreasing elevation. Horticulture occupies particular niches in the hill zone. Tropical foothills are the domain of cereal cultivation.

Table 2: Agricultural typology across the Hindu Kush-Himalaya-Hengduan

Elevation zone (Climate)	West (Arid)	Central (Humid)	East (Per-Humid)
Mountain (Temperate)	- Transhumance (long-distance) - Cereal cultivation (irrigated) - Horticulture	- Transhumance (medium distance) - Cereal cultivation (irrigated)	- Agro-pastoralism
Hill (Sub-tropical)	- Agro-pastoralism - Cereal cultivation (irrigated) - Horticulture (apple)	- Agro-pastoralism - Cereal cultivation (rainfed) - 'Gartenbau' (Kathmandu)	- Shifting cultivation (rain-fed) - Tea plantation
Foothills (Tropical)	- Cereal cultivation (irrigated)	- Cereal cultivation (rain-fed)	- Shifting cultivation (rain-fed) - Tea plantation
Gurung (1999)			

Second, in terms of the east-west variation, animal husbandry is mostly nomadic herding in the trans-Himalaya, long-distance transhumance in the west, and medium to short-distance in the central and east. Long-distance transhumance is represented by the Bakarwal, who traverse 250 km from Dras (3,500m) to Jammu (700m) (Casimir and Rao 1985). The Gaddi of Dhauladhar and Byansi of Darchula had been in the same league but have since been disturbed by development intrusions. In the Karnali zone, Khasa herders' sheep and goats used to travel over 3500m of vertical zone (Bishop 1990). This movement has been hampered by dislocations in the salt trade pattern and community forestry across their passage. Medium to short-distance transhumance is practised by the Magar, Gurung, and Tamang of Central Nepal, and is best documented regarding Sherpa yak herding in the Khumbu area (Stevens 1993). As one moves east, livestock rearing becomes less important, particularly among tribal peoples.

Cereal cultivation is the predominant livelihood mode in the highlands, with variation of crops according to climatic zone. The higher the elevation, the wider the range of crop combinations and the lower the productivity. In the west cereal cultivation is invariably irrigation-based, while the humid east relies more on rain-fed cultivation. Of all hill zone agriculture, that of the Kathmandu Valley may be singled-out as the most intensive (*gartenbau*), being based on hoe cultivation with use of faecal manure. The distinctive feature of agriculture of the east is shifting cultivation where humid climate aids luxuriant vegetation regeneration. Pockets of commercial horticulture and tea plantation are found in areas of road access, with apple prominent in the west and tea in the east.

Any discussion of highland agriculture needs to consider the construction of field terraces. Technical experts contend that sloping terraces contribute to more soil erosion and advise on how to make horizontal terraces! The laying-out of terraces is the highlanders' device to deal with verticality, and sloping terraces are not the product of ignorance or indolence but represent an equation between labour and output. Again let us consider terminology. Horizontal terraces with risers for irrigated crops are known as 'khet'. Sloping terraces for dry crops are called 'pakho'. But some recent works have substituted the term 'bari' for the latter, which is erroneous. Bari and pakho are unirrigated fields but differ in nature and extent. Bari is infield near the homestead, heavily mulched and fenced ('bar'), while pakho are outfields and extensive (Gurung 1987).

Peasant to Farmer

The relative fragility of the mountain may be debated, but there is no question regarding the poverty of the highlanders. Highlands everywhere are marginal areas of human occupation due to the harsh environment. Highland dwellers need to be mobile because of livestock's requirement for seasonal pastorage, and their own need to travel to exchange products and even engage in smuggling if on the border. They have to commute downhill for valley paddy and uphill for potato. It is pervasive poverty that compels the highlanders to impose on the woodland for cropland, fuel, and fodder or else to out-migrate, some as mercenary soldiers.

The objective of this symposium is the development of highland agriculture. Since most highlanders depend on agriculture, improvement in this sector would contribute to poverty reduction and environmental conservation. However, changes will be slow due to the nature of highland agriculture. This is inherent in its subsistence system constrained by relative inaccessibility. The juxtaposition of some aspects of subsistence and market-oriented agricultural systems will make this apparent. The clearest contrasts are shown in Table 3.

Aspects	Subsistence	Market-Oriented
1. Farming situation	Mostly rain fed	Irrigation and draining
2. Mode of cultivation	Animal and human power	Use of machine
3. Nutrient supplement	Animal manure and compost	Chemical fertiliser
4. Crop range	Numerous types	Limited (even mono)
5. Crop variety	Low to moderate yield	High-yielding and hybrid
6. Grain productivity	Below 2 tonnes per hectare	4-6 tonnes per hectare
7. Cash investment	Very little	Considerable
8. Production for	Domestic consumption	Sale
9. Economic process	Stagnant	Progressive
10. Operating agent	Peasant (culture)	Farmer (economic)

¹Modified from Schroeder, 1985, p. 42, Table 7.

The main points are that

- the former is mostly rain fed, the latter irrigated;
- the former depends on traditional sources of labour, the latter machines;
- the former relies on organic manure, the latter chemicals;
- the former has wide crop range for security, the latter the most profitable few;
- the former has low input and low yield, which is reversed in the latter;

- the former's grain productivity is less than half that of the latter; and
- the former is for consumption, the latter for sale.

In sum, the former can be described as a stagnant economic process while the latter is a progressive one with external linkages. It is, therefore, tempting to distinguish the operating agents of the two agricultural systems: the subsistence system is operated by the peasant, and the market-oriented system is developed by the farmer. This imagery has an etymological basis. The word 'peasant' derives from the Middle French *paisant*, which refers to the rustic countryside and has a cultural connotation, a way of life. On the other hand, the word 'farmer' derives from the late Latin *firma*, which refers to fixed payment or tax collection and evokes economic calculation, obviously for profit.

The contrast between agricultural systems, stagnant versus progressive, aids in exploring the possibilities and limits of development intervention. If the prescription is to transform peasants into farmers, it becomes necessary to delve into the compulsions of subsistence economy. Part of the explanation has been indicated by the notion of mountain specificities enumerated as (i) inaccessibility, (ii) fragility, (iii) marginality, (iv) diversity, (v) 'niche', and (vi) adaptation mechanisms (Jodha 1992). Of these six, inaccessibility and marginality, on one hand, and diversity and niche, on the other, are expressions of the same attributes. Of the remaining two, fragility is a debatable proposition, and adaptation mechanism, a compulsion. Thus the core highland specificities are inaccessibility as a constraint and diversity as an asset.

Inaccessibility does pose a problem towards a market-oriented agricultural system. The remoteness of an area implies not only decay of innovations with distance but also a higher transport cost. Yet, many mountain areas tend to be of economic as well as political and security concern to governments in the plains. Thus, large tracts of the HKH have been penetrated by military roads that also sustain the highland economy with access to markets. However, most highland areas will still remain inaccessible, and one would hardly wish for wider conflicts to bring roads there. This would mean promotion of livelihood opportunities beyond subsistence agriculture. In the economic arena, the frontier phenomenon need not necessarily mean a limit but also an extension of possibilities (Gurung 1999). This refers to highland products of comparative advantage based on diversity and heterogeneity. The suggested strategy to exploit types of verticality in agriculture would be product specialisation whose high value can off-set the transport cost. Evidence from the countries of the HKH confirm that mere policy prescriptions do not assure their translation (Blaikie and Sadeque 2000), least of all in the highlands of politico-economic marginality. Thus, those concerned with highland agriculture need to devise practical solutions built on the chemistry of local knowledge and wider experience.

Highland Reality

I will conclude with a quotation. I happen to know both the place and the person who made the observation. Tagaring is the name of the place in Lamjung where a landslide precipitated by the earthquake of January 1934 submerged a flourishing salt brine beside the Marsyangdi River. H. W. Tilman is the person who made the observation (Tilman 1952). He was a pioneer of Himalayan climbing, then switched to sailing and was lost off

the coast of Patagonia. He visited Langtang Himal in 1949 and passed through Tagaring in 1950 on his way to Manang.

“Whether it takes place little by little or in one swift calamity, soil erosion is generally attributed to man’s careless greed, his idleness or neglect. It would not, I think, be fair to blame the people of these valleys on the Himalayan fringe for the frequent landslips which occur there. In turning the steep slopes into fruitful fields, they have been neither lazy nor neglectful.... One might say that on such hillsides, the forest never should have been cleared, in which case, the country must be left uninhabited; or that belts of trees should have been planted which would imply first the giving up of their goats by the villagers”.

References

- Bishop, B. (1990) *Karnali Under Stress*, p. 242. Chicago: University of Chicago Press
- Blaikie, P.M.; Sadeque, S.Z. (2000) *Policy in High Places: Environment and Development in the Himalayan Region*. Kathmandu : ICIMOD
- Casimir, M. J.; Rao, A. (1985) Vertical Control in the Western Himalaya: Some Notes on Pastoral Ecology of the Bakrwal of Jammu and Kashmir. In *Mountain Research and Development*, 5(3):221-232
- FAO/HMGN/UNDP (1980) *A Reconnaissance Inventory of Major Ecological Land Units and their Watershed Condition in Nepal*. Kathmandu: HMGN
- Gurung, H. (1987) ‘Protection of Himalayan Environment: Traverse and Bivouac’. In *Himal Journal (Nepal)*, 9-11
- Gurung, H. (1987) ‘Interpretation’. In Blaikie, P.; Brookfield, H. (eds) *Land Degradation and Society*. London: Methuen
- Gurung, H. (1999) *Mountains of Asia : A Regional Inventory*. Kathmandu: ICIMOD
- Jodha, N.S. (1992) ‘Mountain Perspective and Sustainability : A Framework for Development Strategies’. In *Sustainable Mountain Agriculture*, 1:41-82
- Jodha, N.S.; Banskota, M.; Partap, T. (1992) (eds) *Sustainable Mountain Agriculture*. Vol. I (Perspectives and Issues), Vol. II (Farmers’ Strategies and Innovative Approaches). New Delhi: Oxford and IBH
- Kenting Earth Sciences (1986). *Land Resources Mapping Project (LRMP): Land, Systems, Land Use and Economics Reports* (text in 8 vols., maps of 1:50,000 in three vols.). Kathmandu: LRMP
- Rhoades, R.E. (1992) ‘Thinking Globally, Acting Locally: Technology for Sustainable Mountain Agriculture.’ In Jodha N.S., Baskota M. and Partap, P. (eds) *Sustainable Mountain Agriculture*, 1:225-272
- Stevens E.S. (1993) *Claiming the High Ground*. Berkeley: University of California Press
- Schroeder, R.F. (1985) ‘Himalayan Subsistence Systems: Indigenous Agriculture in Rural Nepal’. In *Mountain Research and Development*, 5(1):31-44
- Tilman, H.W. (1952) *Nepal Himalaya*, pp 126-127. Cambridge: Cambridge University Press
- Troll, C. (1967) ‘The Climatic and Phytogeographical Division of the Himalayan System’. In *Khumbu Himal*, 1:353-388