II

Overall Concerns

Egbert Pelinck,
Director General, ICIMOD

Over the past ten years, ICIMOD has developed active linkages with hundreds of research, development, and educational organisations in the Hindu Kush-Himalayas. As a relatively small international centre, its comparative advantages lie in partnership and collaboration with development agencies both inside and outside the region. Although the primary beneficiaries are the mountain people, ICIMOD works through different national, provincial, county, and local development organisations that have far better roots on the ground.

Insofar as mountain agriculture is concerned, ICIMOD has made major efforts during the past decade in a number of areas.

- Developed a better conceptual and empirical understanding of the changes in mountain agriculture in the Hindu Kush-Himalayas
- Identified success stories and assessed their underlying processes, mechanisms, and policies in order to replicate them
- Identified and promoted soil-conserving technologies
- Undertaken different institutional strengthening activities to promote the sustainable development of mountain agriculture.

The important achievements of past activities in sustainable mountain agriculture have been the following:

- development of the mountain perspective framework which has helped to assess the appropriateness of development decisions to mountain areas;
- reviewed the status of mountain agriculture in different countries of the HKH region, which has improved our understanding of the diversity of mountain environments as well as of the policies and programmes of different governments;
- identified success stories in the transformation of mountain agriculture, including an assessment of their replicability insofar as technologies, policies, programmes, and institutional mechanisms were concerned;
- field-tested appropriate technologies for soil conserving farming systems in different ecoregions in the Hindu Kush-Himalayas, jointly with national partners; and

... The mountain perspective framework has facilitated a better understanding of the problems and opportunities in mountain agriculture.

E. Pelinck

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- assessed existing institutional capabilities in mountain agricultural development and the support and strengthening needed for different national and provincial agricultural development agencies working in mountain areas.

It is in the context of institutional strengthening for sustainable mountain agriculture that ICIMOD is organising this present consultation to mobilise the support of agricultural research and educational organisations. The specific objectives of this consultation are:

- to assess the current state of agricultural research, education, and training within academic and research institutions in the context of a mountain focus;
- to identify the gaps in the required roles of agricultural universities and research institutions in the region for sustainable transformation of farming in the Hindu Kush-Himalayas;
- to identify priority areas for research, teaching, and training in sustainable mountain agricultural development in the HKH; and
- to identify mechanisms through which data exchange, sharing of experiences, and joint programmes related to the sustainable development of mountain agriculture can be established and promoted in the future between universities, national agricultural research centres, and concerned agencies in the HKH Region.

If the challenges are increasingly clear, the most effective development responses for sustainable mountain agriculture are far from clear - despite massive, if highly fragmented (or sectorally compartmentalised), government and aid agency interventions throughout the mountains. While there is no scarcity of gloomy predictions regarding mountain agriculture, successful and preventative methods seem very hard to identify and replicate with the speed and scale urgently required.

Rational management of natural resources in the mountains depends on the integrated development of improved and diversified mountain farming systems, better infrastructure support for the hill farmer, more effective forest and pasture and watershed management — but equally and essentially — on new attitudes and commitments (at local, district, regional, and national levels), integration of indigenous knowledge, decentralised community action, community responsibilities, and community-based gender-sensitive decision-making.

Today, the challenge for all of us is how to bring about growth in productivity without damaging the environment. I am confident that, with the growing interest and commitment of agricultural departments at the national, state, and provincial levels, Agricultural Universities and international organisations can join hands to work for a sustainable future for mountain agriculture. For all the good things we have enjoyed from the mountains, this is the minimum we can give back.

Tom Derksen, SNV (The Netherlands) Representative, Nepal

You may wonder why a flat and swampy country like the Netherlands, with half of its surface below sea level, is interested in mountains at all. Well, obviously there is the usual fascination with those things that one does not have, and this is why annually 8,000 plains' land Dutch mountain lovers come to enjoy the wonderous mountains of Nepal.

Yet, the development cooperation interest has another reason and stems from the fact that, in mountain regions, we encounter three areas of concern, all of them interlinked and constituting a central theme in Netherlands' policy. They are the following.

- Firstly, poverty: where do we often find pockets of poverty? Obviously in the mountains with their problems of difficult accessibility, scarcity of agricultural resources, and social and political marginalisation that commonly form barriers for economic and social prosperity.
- Secondly, environmental conservation: where does one often encounter serious forms of environmental degradation? Again, in the mountains, where the fragility of the environment, inappropriate planning of physical infrastructure, and intensive utilisation of available resources together result in serious environmental degradation.
- Thirdly, gender concerns. These are well described in one of ICIMOD's recent papers by Jeannette Gurung. Women in mountain communities, given their overall lower status and literacy levels, often are doubly marginalised in the vicious circle of poverty and resource degradation. Their opinions, needs, and perceptions are rarely reflected in national policies and international fora.

Nowhere is the intricate link between poverty and environmental degradation more obvious than in mountain regions. And nowhere is the need for addressing these problems in an integrated and gender balanced manner more obvious. By putting people up front, sustainable resource management systems should be designed, integrating human needs with environmental realities.

What then is the specific Netherlands' interest in ICIMOD?

On the one hand, it is because the majority of the countries participating in ICIMOD have bilateral cooperation programmes with the Netherlands. This is the case with five of the eight ICIMOD countries.

On the other hand, it is because the Netherlands considers regional cooperation essential to address common interest problems and to translate them into transboundary action plans. Encouraging a sense of shared responsibility and facilitating an exchange of governmental and non-governmental actors in society, as well as strengthening the capacities of concerned organisations, are important objectives of regional cooperation programmes.

...Putting People Upfront

...Listening is crucial in such cooperative efforts.....

...ICIMOD provides a platform for....

... Mutual listening and learning

T. Derekson

...Most mountain areas need to expand their economies at a fairly rapid rate to satisfy the legitimate aspirations of their people. This will entail a significant increase in the use of natural resources. The challenge is to attain this without harming fragile mountain environments.

S. B. Deuba,
Prime Minister of
Nepal

We believe that listening is crucial in such cooperative efforts, listening to other countries' experiences, listening within countries to the voices of the mountain men and women whose future is at stake. They are the keepers of the secrets of the mountains. Understanding their survival skills and embedded indigenous wisdom teaches us great lessons and helps to pave the way towards a sustainable future. We believe ICIMOD is in a unique position to bring the interests of individual countries together and to provide a platform for such mutual listening and learning. Operating at the interface between research and development, ICIMOD is well situated to address mountain problems, look at alternative strategies and approaches, and turn disadvantages into advantages and constraints into opportunities.

Today's regional consultation on agricultural research and education, which is part of the Netherlands' supported Institutional Strengthening Programme, sets out to do just that. The consultation's underlying objectives to move the focus of curricula and research agendas upwards, from the plains to the mountains, thus following the Dutch trekkers in their fascination with the mountains, is an important step towards increased listening and learning.

I would like to assure ICIMOD of continued Netherlands' core funding support in the years to come.

I would like to wish the participants great success in the coming days - working in the mountains for the mountains - working with mountain people for the mountain people.

Sher B. Deuba, Hon'ble Prime Minister of Nepal*

It is a great pleasure and privilege for me to be here with you today. I am grateful to ICIMOD for inviting me to share with you some of my views in this important Regional Consultation on Agricultural Research and Education for Sustainable Mountain Agriculture.

I am greatly encouraged by the fact that such a highly reputed group of professionals has assembled here to discuss research and education for mountain agriculture. It is probably the first time that so much scientific, professional, and management wisdom is being brought together in one place to discuss mountain agriculture. If this can result in concrete follow-up activities in mountain areas, I am confident that the future has bright prospects for mountain farmers. It is only through consultations like this one that we can overcome the strong biases in development that work against mountain areas. Fortunately, many of the concepts of mainstream development are also being questioned today and changes are being made. Let us hope mountain areas will benefit from these changes by not only receiving more research and educational attention, but also through a style of development that is more mountain friendly.

Most mountain areas need to expand

** Shortened version of the speech that was read out at the meeting.*

their economies at a fairly rapid rate to satisfy the legitimate aspirations of their people. This process of expansion will entail a significant increase in the use of natural resources. The challenge for us all is to attain this without harming fragile mountain environments. Our lifestyles and development patterns must therefore be compatible with these environments, otherwise pollution, degradation, and damage will set in fairly quickly. Thus, while a progressive rise in the standard of living is a legitimate aspiration of the people of mountain areas, this does not mean that we should mimic wasteful and polluting lifestyles. On a priority basis, our development strategies should aim at satisfying basic human needs in terms of food, education, health, safe drinking water, and a healthy and secure environment. Full use should be made of modern science and technology, as well as indigenous knowledge, to realise these development goals.

I think we all agree that mountain populations will probably double in the next three decades. We have some idea about how the majority of mountain people survived in the past—expanded their cultivated areas; migrated, both seasonally and permanently; and, more recently, started to develop other economic activities. The big question is are these changes adequate to meet the demands of future mountain populations? Already the difficulties, in terms of inadequate resources and environmental stress, are fairly apparent throughout the mountains. Poverty, the biggest curse in mountain areas, is common throughout.

Humanity's success in feeding the growing population of the world during the past five decades has been truly spectacular. In many areas, previously famine-ridden people no longer have to worry about food *per se*. They can turn their attention to improving their incomes to provide themselves with reasonable access to food and other necessities. Whereas the Green Revolution is now running out of steam in many areas of the world, and there is renewed concern about the future of agriculture in the plains, the

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Hon'ble Prime Minister of Nepal, Sher Bahadur Deuba, addressing the participants

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mountain areas did not benefit significantly from this technology. This is because these technologies were better suited to stable, uniform, resource-rich conditions accompanied by good water supplies and soils found in the plains. These technologies did not work well in ecologically complex and fragile environments such as the mountains of the Hindu Kush-Himalayas.

Ladies and gentlemen, it is now up to us to find the appropriate technologies, the practices, the human skills, and the solutions needed to make mountain agriculture sustainable. We need to devise systems that serve the needs of mountain farmers. This does not necessarily mean restricting our efforts to food crops, as experiences with high-value crops in many accessible pockets throughout the mountain areas are demonstrating. What are the comparative advantages of specific mountain areas ? How can these be developed so that the benefits of these developments can be felt on small mountain farms? What are the problems in terms of environmental management and what can be done in affordable terms?

We cannot afford to be over ambitious or unrealistic. The resources available are extremely limited and, unless we can generate more resources ourselves, the well will run dry, as donors are unable to provide the resources as they have in the past.

The contribution that agricultural research and education can make to transforming mountain agriculture and rendering it more sustainable is unquestioned. In the past, most of the efforts have gone into increasing output at the cost of other resources. In future, agricultural research and education should give priority to techniques and practices that enhance production without damaging the environment. To facilitate this, much greater commitment is needed on the part of governments in terms of investment in developing appropriate research and educational systems for sustainable mountain agriculture. There is also a need for a careful review of policies so that the prevailing biases against the development of mountain agriculture are removed. While you discuss the different issues during the next few days, think about the mountain farmers and their families and their homesteads situated on steep mountain slopes. How will your message be relevant to them? How can they benefit from your wisdom and insight?

Finally, as I leave you with these thoughts, I wish you a very productive meeting and look forward to your recommendations. I also invite you to look around, see this historic city, and enjoy the Himalayas; the mountains that may appear to be in the background, but which I am confident are in the foreground of your thoughts at this meeting. Thankyou.

Amir Mohammed*
President, ASIANICS, Islamabad

The main source of sustenance for the population in the HKH region is

* Dr. Amir Mohammed's paper "Reforming the Agricultural Research and Education Systems of the HKH Region for Sustainable Mountain Development: Needs and Challenges" was the Keynote Address at the workshop

agriculture, including field crops, horticulture, livestock, forestry, and, to a smaller extent, fisheries. Land holdings are very small and becoming further subdivided as the population increases. Widespread poverty and the pressure of population force the people to eke out a living from non-sustainable and often environmentally damaging use of the natural resource base. The desperate need for food, firewood, and shelter — the very basic requirements for human survival have led to the degradation and widespread erosion of the fragile land resources and denudation of the forest areas.

Agricultural Production: A Complex System

Improved technology is only one, *albeit* a very important, input into the agricultural production system. Besides generation and dissemination of improved technology through education, research, and extension sub-systems, the organisation of input supplies' networks, farm credit, harvest and post-harvest management of produce, and domestic and export marketing supported by an adequate communication infrastructure are very important aspects of healthy agriculture. Rural areas, particularly in the largely inaccessible mountainous regions, are devoid of basic amenities, and this makes the quality of life unattractive for ambitious youth who consequently migrate to urban areas in search of better amenities and social status. Land tenure aspects, especially absentee landlordism, outmoded land registration and transfer methods that have led to a lot of corruption and prolonged litigations, and several other sociocultural aspects of rural life that adversely affect agricultural productivity need to be carefully researched and improved.

Unless all these aspects are simultaneously improved, the mere availability of improved technology cannot achieve the desired end result of healthy, vibrant agriculture at the grass

....absolute landlordism, outmoded land registration and transfer methods....

Prolonged litigations and several other sociocultural aspects.... adversely affected agricultural productivity.

Horticulture and pasture management... important in the mountain areas are not sufficiently covered in curricula.

A. Mohammed

Seabuckthorn replication feasibility mission of ICIMOD in China - facilitating the transfer of Chinese knowledge and experiences across the HKH (Jianping County, China, 1991)
Tej Partap

Agriculture in mountainous areas is largely based on integrated crop-livestock-agroforestry farming systems, whereas the educational system is implicitly based on the monoculture of individual commodities

A. Mohammed

roots. Thus, efficient management of the overall complex agricultural production system (along with improvement of the various components) is the key to development of progressive and sustainable agriculture.

Institutional Framework for Agricultural Education and Research

Most countries in the region have agricultural universities/colleges and research institutes located in mountain regions. These institutions, barring a few in the Indian and Chinese HKH territories, suffer from all the handicaps that their sister institutions in the plains suffer from: shortage of trained staff, funds, laboratory equipment, library facilities, and transport for field experimentation and contact with the farmers. In addition, being located in the relatively inaccessible areas, they find it harder to attract and retain qualified scientists as their staff members.

Agricultural Education Institutions

Educational institutions located in the HKH region have been extensively reviewed in the country reports published by ICIMOD in 1995. Most of these institutions suffer from the following problems.

i. Their organisational structures and curricula emphasise crop production under irrigation, and this is unsuitable for mountain ecological and socioeconomic conditions.

ii. Agriculture in mountainous areas is largely based on integrated crop-livestock-agroforestry farming systems, whereas the educational system is implicitly based on the monoculture of individual commodities, mostly food and cash crops. Horticulture and pasture management, which are very important in mountain areas, are not sufficiently covered in the curricula.

iii. Adequate emphasis has not been given in the curricula to the fragile aspects of the mountain environment.

iv. Linkages of these institutions with research institutes, extension organisations, and the public sector development system are often quite weak. Educational institutions often confine themselves to on-campus teaching.

v. There is little interaction between teaching institutions and farmers.

While it is difficult to generalise on the situation of all the agricultural universities/colleges in the HKH region, it would be worthwhile to describe, in some detail, the situation of the main institution in Pakistan.

- The curricula are copied almost entirely from and designed mostly for irrigated agriculture in the hot plains.
- Very little emphasis in the curriculum is given to livestock, forestry, range management, or aquaculture.
- The agricultural colleges have no expertise in agriculture at the senior management level.

- The Colleges have no formal linkages with State agricultural departments. The agricultural community is not involved in identification of problems in the agricultural sector or in finding solutions to them through research.

- The colleges have no outreach programme — the farmers rarely visit the college and the college faculty and students do not undertake research on farmers' problems.

- Very few funds are provided to the colleges for research and outreach.

This unsatisfactory situation needs to be rectified urgently by transferring the colleges to the State agricultural departments, drastically revising the curriculum to bring it in line with the prevalent farming systems, and entrusting them with the responsibility for research and outreach to the colleges. Above all, the colleges must develop close two-way linkages with the farmers and devote maximum efforts to improving the net income of farmers and conservation of natural resources.

Research Institutions

Most of the research institutions devote their efforts to field crops, especially cereals— wheat, maize, and rice, and, in some cases, potatoes. The research is limited mainly to evolving higher yielding varieties and pest management, fodder production, pasture management, horticultural crops, and agro-forestry, especially as components of integrated farming systems based on several commodities, are often not included in the research agenda of these institutions. Most research efforts are limited to biological and agronomic aspects, while research on farm machinery, sustainable use of the resource base, soil conservation, and socioeconomic aspects is almost entirely neglected.

A principal problem in mountain areas is the primitive methods of post-harvest processing and marketing of produce, as a result of which the net income of farmers is quite low, even if yields are high as a result of using improved production technology.

Women play an important role in the household economies of mountainous areas, especially in livestock management, small farmer poultry production, harvest and post-harvest management of most field crops, production and processing of horticultural crops, and several other aspects of agricultural production and marketing. In spite of this, very little attention is given to training women in different aspects of agriculture and research on gender-specific problems.

There is an urgent need to critically review the research programmes of these institutions and orient them towards solving priority problems, with a strong emphasis on optimising farm incomes from smallholdings through sustainable use of natural resources. Most of the institutions have never been subjected to external peer review and continue to do research on the same topics, sometimes for decades. This results is considerable misuse and wastage of precious human and financial resources.

...Sustainable use of the resource base, soil conservation and socio-economic aspects are almost entirely neglected.

...Very little attention is given to training women in different aspects of agriculture and research on gender-specific problems.

A. Mohammed

Education and research programmes should be closely linked. Farmers need to be fully associated with both the teaching and research functions, and their perceptions should be reflected in the curricula as well as in the priorities of the research agenda. Finally, the institutions should be adequately funded so that qualified researchers do not feel constrained to undertake their approved research programmes due to deficiencies in the laboratory, library, or farm facilities. Because of the relative isolation of mountain areas, it is even more essential to provide adequate support to keep their morale reasonably high.

International Agricultural Research Centres

Against the background of the rapidly increasing population and growing food shortages in the developing countries during the 1950s; necessitating heavy food imports, which they could ill afford due to difficult economic situations; International Agricultural Research Centres (IARCs) especially for rice (IRRI 1960) and wheat and maize (CIMMYT 1966), based in the Philippines and Mexico respectively, developed dwarf, fertilizer-responsive varieties of wheat and rice which were quickly adopted by farmers, especially in Asia. These varieties gave substantially higher yields than the conventional tall varieties and led to the so-called Green Revolution.

The CGIAR Centres have contributed substantially to the development of trained manpower in national agricultural research systems (NARS)....

A. Mohammed

Convinced of the tremendous impact of the IARC model on improving food production in the developing countries, the donor community, led by the World Bank, UNDP, and FAO as co-sponsors, decided to form a Consultative Group on International Agricultural Research (CGIAR) in 1971.

As a result of the considerable expansion of the CGIAR system, the number of IARCs has increased to 16 and the annual budget of the IARCs in the system increased from $19.5 million in 1972 to $342 million in 1994.

Initially, the CGIAR centres focussed primarily on generating improved technology to enable increased, sustainable production of various commodities, especially under small farmers' conditions. The research agenda of the CGIAR has gradually increased emphasis to sustainable production, resource conservation, equity, gender issues, and development of national capabilities to organise research in the national institutions. The CGIAR centres have contributed substantially to the development of trained manpower in the national agricultural research systems (NARS), provision of research materials, and linking national institutions in problem-oriented regional research networks.

Several of the above IARCs already have active research programmes in the HKH region in collaboration with the national institutions. Since ICIMOD has the primary responsibility as an international institution for development of the HKH region, it would be desirable for this centre to play a coordinating role in packaging technology for improving the region's agriculture, in close association with the relevant national institutions and the IARCs. The comparative advantage of the three sets of institutions can be

incorporated in devising a cost-effective strategy for organising research specific to the problems of agriculture in the HKH region.

The networking approach that has often been used very productively by several IARCs would be appropriate for linking institutions for such collaboration.

Mr. Egbert Pelinck, Director General, ICIMOD; the Hon'ble Prime Minister of Nepal and Donor Representative, Mr. Tom Derksen, at the Inaugural Session

Technical Session in progress: presentation of research and education issues by Dr. M. Banskota, Deputy Director General, ICIMOD