

# Conclusions and Recommendations from the Workshop

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## Background

This Regional Expert Meeting on Rangelands and Pastoral Development in the Hindu Kush-Himalayas was organized by ICIMOD to bring together rangeland, forage, livestock, and wildlife specialists from ICIMOD's member countries to: (1) discuss issues related to the sustainable management of rangeland resources and pastoral development in the Hindu Kush-Himalayan (HKH) mountain region; (2) identify opportunities that exist for improving the management of rangelands; and (3) formulate specific recommendations on technologies, management systems, and policies to promote more sustainable use of rangeland resources.

Topics covered during the paper presentations and discussions included country rangeland status reports from the major countries (Bhutan, China, India, Nepal and Pakistan), rangeland ecology, socio-economic aspects of pastoral production, livestock production, rangeland biodiversity and wildlife conservation, forage and fodder development, major issues, and priorities for action. The Meeting provided an excellent opportunity for specialists from the region to share information and ideas related to rangelands.

Based on the discussions that took place, and the interest shown among all partici-

pants, it is anticipated that one eventual outcome of the Meeting will be that greater attention and resources will be directed to rangeland management and pastoral development by national governments and development agencies. It is also expected that the Meeting will lead to greater collaboration and exchange of information between rangeland specialists, conservationists, and development workers in the HKH region and outside the HKH region in the future.

Despite the fact that rangeland environments have not received the attention they deserve from governments and development agencies, there are specialists committed to rangelands and actively working out in the remote rangeland regions of the HKH. Many of those specialists were present at this Meeting. The papers in this proceedings are a testimony to the excellent work on rangelands, forages, and pastoralism being conducted by these people.

This workshop has made a significant contribution to the expansion of knowledge on rangeland environments in the HKH. Programmes now need to be introduced that will address the many issues highlighted in this proceedings in order to promote more sustainable use and management of rangeland resources. Recognising the limited funding resources available for range and pastoral development and the lack of

trained range specialists, the Meeting sought to prioritise development actions that should be taken. Although opinions varied depending on participants interests and specialities, broad consensus was reached on the major issues facing rangelands and priority actions needed to conserve rangeland biodiversity, improve rangeland management and pastoral development programmes, and to promote forage and fodder development (see Boxes).

### **Rangeland Biodiversity**

Conservation of biodiversity on the HKH rangelands is facing numerous issues (Box 1). Major issues include the loss of species and decrease in biodiversity, wildlife

habitat degradation and loss of habitat, lack of knowledge about the biodiversity in rangeland environments, uncontrolled hunting, and competition between wildlife and livestock for forage. Inadequate government policies and lack of trained staff to monitor biodiversity on the rangelands are also issues facing biodiversity conservation in rangeland environments.

Actions need to be taken on a number of fronts to protect and conserve biodiversity, but priority actions include research on wildlife habitat, wildlife ecology, and wildlife-livestock interactions; control of illegal hunting; creation of additional reserves to protect biodiversity not included in the existing protected area network; and conservation

#### **Box 1**

### **Major Issues Concerning and Priority Actions for Rangeland Biodiversity**

#### **Rangeland Biodiversity**

##### *Major Issues*

- decrease of biodiversity/loss of species
- habitat loss
- illegal hunting
- lack of data/knowledge/awareness
- overgrazing
- wildlife-livestock competition
- climatic changes
- cultural diversity problems
- medicinal plants — lack of knowledge
- inappropriate government policies
- lack of monitoring

##### *Priority Actions*

- research on:
  - wildlife movements/grazing systems
  - wildlife habitat
  - wildlife and range ecology
  - wildlife-livestock interactions (monitoring diets, etc.)
  - indigenous pastoral management systems
- awareness campaigns, education
- establish biosphere reserves
- create monitoring teams
- control illegal hunting
- manage stocking rates/sell unproductive animals
- establish a biodiversity database
- rehabilitate overgrazed ranges
- introduce improved forages
- incorporate indigenous knowledge into development plans
- create off-farm and alternative employment opportunities
- promote appropriate land ownership rights/legislation for tenure

**Box 2**  
**Major Issues Concerning and Priority Actions for**  
**Rangeland Management and Pastoral Development**

**Rangeland Management/Pastoral Development**

*Major Issues*

- fodder shortages, especially in winter
- lack of information on range ecosystem processes
- lack of technical support
- lack of trained manpower
- agricultural encroachment on ranges
- rangeland degradation
- land tenure problems
- settling of pastoralists
- lack of community participation in development efforts
- lack of herder education
- lack of knowledge of traditional systems and pastoralists' indigenous knowledge
- lack of accurate socioeconomic data on pastoral systems
- lack of data on flora-fauna interactions
- large herds
- climatic hazards (aridity, poor soil, erosion)
- lack of adequate winter grazing
- overgrazing
- local management systems no longer viable
- lack of alternative income activities
- lack of economic incentives to adopt new technologies
- poor government commitment to pastoral communities
- exclusion of women from involvement in pastoral development programmes

*Priority Actions*

- train professionals and locals
- create opportunities for two-way exchange of information between pastoralists and professionals
- develop programmes to study traditional systems and perceptions of pastoralists' problems
- improve forage/fodder resources, especially in winter
- improve people's participation and community organization
- conduct applied rangeland research
- determine extent and severity of rangeland degradation
- develop appropriate land tenure legislation and policies
- distribute available technologies to pastoral areas
- develop seed and gene banks
- develop snowmelt water collecting techniques

education and biodiversity awareness campaigns.

**Rangeland Management and Pastoral Development**

Major issues associated with rangeland management and pastoral development (Box 2) include rangeland degradation, lack of forage in winter and spring, overgrazing,

lack of information on pastoral systems, lack of information on range ecosystem processes, lack of trained rangeland and pastoral development specialists, and poor commitment on the part of governments for pastoral areas. The lack of pastoralists' participation in planning development programmes is also a major issue, especially with respect to the involvement of women since they play a major role in pastoral pro-

### Box 3

## Major Issues Concerning and Priority Actions for Forage and Fodder Development

### Forage and Fodder Development

#### Major Issues

- shortage of feed/fodder in winter and early spring
- lack of fertilizer to establish legume forages
- lack of land for forage cultivation and pasture establishment
- high cost of inputs
- lack of dedicated extension staff
- lack of appropriate varieties of production systems
- lack of improved forage seed
- lack of appropriate, sustainable technology and related support
- poor communication between herders/farmers and technicians
- lack of methods for hay production and conservation
- native forage species for improvement not identified
- lack of forage distribution system in remote pastoral areas
- poor genetic characteristics of livestock
- limited markets for livestock products
- lack of fodder banks
- competition between food and fodder crops

#### Priority Actions

- establish improved forages and hay crops
- develop appropriate technologies for fodder conservation
- use fallow and marginal land for forage cultivation
- establish hay meadows
- improve profitability of livestock rearing vis-a-vis crops
- support seed production of forages
- integrate food-forage crop systems
- conserve forage for winter and spring
- establish forage and forage seed banks
- promote silage technology
- conduct improved feeding demonstrations
- test winter period forage species
- organize training on forage conservation
- establish forage production user groups
- emphasise year-round forage production
- introduce forages with low water and mineral requirements
- create agencies to distribute forage seeds to pastoralists
- promote stall feeding
- research to identify forages for high altitude zones

duction. With changes arising from modernisation processes, many traditional management systems are no longer viable. The lack of alternative employment opportunities in pastoral areas is also of concern, especially with increasing human populations. Finally, the poor quality of education among pastoralists is a factor limiting their access to new technologies.

Actions required to improve rangeland management practices and promote more sustainable pastoral development are numerous, but priority actions include improving forage and feed supplies in the winter, the need for applied rangeland research

on numerous aspects, encouragement of greater participation by local pastoralists in development planning, training rangeland technicians, dissemination of new technologies, and developing appropriate land tenure legislation and rangeland policies.

### Forage and Fodder Development

Forage and fodder development is the key to improving livestock productivity on the rangelands. Major issues regarding forage development include lack of suitable improved forage species for many rangeland areas, lack of technologies for low-cost for-

age establishment, high cost of forage seeds and fertilizers, lack of dedicated extension staff, and poor communications between forage specialists and pastoralists.

Priority actions for forage and fodder development include development of appropriate forage technologies for different agro-ecosystems, especially for higher elevations; promote forage seed production; organize forage production user groups; promote stall feeding; and identify native forages for rangeland rehabilitation.

### **Designing Development Strategies for Rangelands in the HKH**

Strategies for improved management of rangeland resources and sustainable pastoral development in the HKH should strive to protect and enhance rangeland biodiversity, promote more sustainable livestock production systems, rehabilitate degraded rangelands, improve people's incomes and well-being, and contribute to overall economic development in rangeland areas. Developing such strategies requires a much better understanding of range ecosystem dynamics and animal-plant interactions, increased knowledge of pastoral production systems, more thorough analyses of the issues and opportunities facing rangelands and pastoralists, and modifications in current policies and approaches to development. The following paragraphs outline some of the factors that should be considered in developing strategies for rangelands and in preparing development programmes.

#### *Adopt a Systems' Approach*

Since rangelands encompass diverse resources and land uses, an integrated systems' approach is needed to acquire a better understanding of rangeland ecosystem processes and to identify the opportunities that exist for more sustainable development.

Pastoral development needs to take place in the context of integrated natural resource management and overall economic development. For this to happen, pastoral sociologists, livestock and natural resource economists, and biodiversity specialists need to work closely with range, forage, livestock production, and watershed management specialists.

#### *Develop a Better Understanding of Range Ecosystem Dynamics*

There is good descriptive information about many of the rangeland ecosystems in the HKH (plant and wildlife species list, vegetation types, etc), but our understanding of how the various rangeland ecosystems function is still limited. Strategies for rangelands need to develop a better understanding of rangeland processes and ecosystem functioning. Rangelands are complex environments and proper management of these grazing lands requires more detailed information about soil-water-plant processes, plant-animal interactions, and wildlife-livestock interactions. Many semi-arid pastoral areas of the world are increasingly being viewed as non-equilibrium systems. Such views postulate that climatic factors are more of a driving force in determining vegetation growth patterns instead of the more traditional view that livestock are the primary factor affecting rangeland vegetation. These new concepts need to be explored in the context of HKH rangeland systems as they could help in developing a better understanding of range ecosystem dynamics.

#### *Develop a Better Understanding of Pastoral Production Systems*

Resolving many of the pastoral development issues in rangeland environments requires better information on pastoral production systems. Understanding the aims,

purposes and goals of the pastoralists is the key to sustainable pastoral development. This requires more information on livestock production parameters, including population trends, herd movements, livestock grazing behaviour and food habits, calving and lambing rates, etc. Since women are important players in livestock management, the role of women in pastoral systems needs to be given greater attention. Development programmes for pastoral areas must be socially as well as ecologically appropriate, and this calls for a much better understanding of the social dimensions of rangeland ecosystems, including the social values attached to livestock and livestock management practices, land tenure, and community interactions. With modernisation, pastoral areas are undergoing rapid changes. How pastoralists are adapting to these changes is an important research area.

#### *Give Greater Consideration to Rangeland Biodiversity*

As wildlife is a valuable resource in rangeland areas of the HKH, greater attention needs to be given to conserving and managing wildlife. The distribution, status, and ecology of many species found in the high elevation rangelands of the HKH are poorly known at the present time. Interactions between wildlife and livestock also need to be better understood in order to assist pastoral development planning and biodiversity conservation. Conservation of wildlife cannot be considered without including the attitudes of local people to wildlife. Conservation programmes need to encourage greater participation from local people and allow for local resource use from pastoralists living in the vicinity of protected areas.

Rangelands not only provide plants used as forage by livestock and wildlife; numerous plants found in the rangelands have medicinal or economic value. The multiple-use aspects of rangelands must be given greater consideration.

In considering the biodiversity of the rangelands, emphasis also needs to be placed on conserving the genetic diversity of domestic livestock. Most of these local breeds are well adapted to local conditions and any strategies for biodiversity conservation should consider conserving these valuable genetic resources.

#### *Make Use of New Tools for Integrating and Updating Information*

Recent technological advances in computer data processing, geographic information systems (GIS), decision support systems, and remote sensing have valuable applications for range resource management. Their use needs to be encouraged when planning rangeland and pastoral development.

#### *Develop More Appropriate Range and Pastoral Policies*

Policies for pastoral areas should acknowledge the efficacy of many traditional pastoral production practices and seek to understand range resource dynamics and current land use practices before advocating substantial changes in the name of 'development'. Proper incentive frameworks also need to be established for pastoral areas to encourage herders to adopt new technologies and practices that they find appropriate. Livestock development in many countries has been undermined by inappropriate input and output pricing, subsidies, interest rates, and cost recovery policies which have discouraged destocking

and investments in rangeland management. In order to better integrate biodiversity conservation with range-livestock development, policies for rangelands should also emphasise multiple-use management practices.

### *Innovative Roles for Donor Agencies*

Since rangeland ecosystem dynamics and pastoral production practices are still poorly understood in the HKH, donors and development agencies need to adopt a more flexible approach towards range and pastoral development. The diverse range ecosystems and pastoral systems found on the HKH rangelands require rather localised interventions and research in pilot areas combined with long-term institutional building efforts. The design of projects, as well as funding arrangements, should be flexible and allow for adjustments as more knowledge becomes available. Within projects, decision-making should be decentralised to local levels to enable managers in the field to respond to local conditions. Since the emphasis should be shifting from capital investments to institution building, investment requirements for many range and pastoral projects will be low and donors will need to accept that projects, which need a lot of manpower in their design and supervision, require only limited funding and thus do not show well on the balance sheet. Donors may need to shift from detailed project agreements covering short time periods to flexible programme approaches covering a longer time span.

### **Conclusion**

The fact that numerous, prosperous pastoral cultures and wildlife remain to this day on the HKH rangelands bears witness to the remarkable diversity and productivity of these unique ecosystems, as well as the

sustainability of their resources if used wisely. Pastoral areas throughout the HKH are coming under increasing pressure from an expanding human population but, if properly managed, they should be able to sustain watersheds, supply much of the projected increased demand for livestock products, provide critical habitat for wildlife (including many endangered species), and continue to provide livelihoods for millions of people. New perspectives that are emerging about rangeland ecosystems and pastoral production practices provide valuable frameworks for assessing HKH rangeland ecosystems and suggest fresh approaches for designing pastoral development in ways that complement environmental conservation. Pastoral development programmes will need to take into account local resource possibilities and constraints and the sensitivities of pastoralists. Development programmes should be flexible enough to take into account new information as it emerges and to support activities based on technologically and socially accepted options. Only thus will the long-term viability of the rangelands of the Hindu Kush-Himalayas be protected and enhanced.

Timely action needs to be taken to acknowledge the efficacy of many traditional pastoral strategies and practices, to evaluate the rangeland resources, and to realistically appraise development alternatives for the HKH rangelands. These actions are crucial in order to ensure sustainable economic development and environmental protection in the face of growing threats from modernisation. Such action requires a concerted effort on the part of range ecologists, livestock specialists, forage agronomists, wildlife biologists, sociologists, economists, and development planners to devise development programmes sensitive to the range resources and the needs of

