

Strategic Innovations for

Improving Pastoral Livelihoods


in the Hindu Kush-Himalayan Highlands

Volume I: Workshop Proceedings



Editors
Camille Richard
Kate Hoffmann

About ICIMOD

The International Centre for Integrated Mountain Development (ICIMOD) is an independent 'Mountain Learning and Knowledge Centre' serving the eight countries of the Hindu Kush-Himalayas – Afghanistan , Bangladesh , Bhutan , China , India , Myanmar , Nepal , and Pakistan  – and the global mountain community. Founded in 1983, ICIMOD is based in Kathmandu, Nepal, and brings together a partnership of regional member countries, partner institutions, and donors with a commitment for development action to secure the future of the Hindu Kush-Himalayas. The primary objective of the Centre is to promote the development of an economically and environmentally sound mountain ecosystem and to improve the living standards of mountain populations.

Strategic Innovations for Improving Pastoral Livelihoods in the Hindu Kush-Himalayan Highlands

Proceedings of an International Workshop held in
Lhasa, Tibet Autonomous Region, People's Republic of China
May 12-19 2002

Editors

Camille Richard
Kate Hoffmann

International Centre for Integrated Mountain Development (ICIMOD)
Natural Resource Management (NRM)
Kathmandu, Nepal
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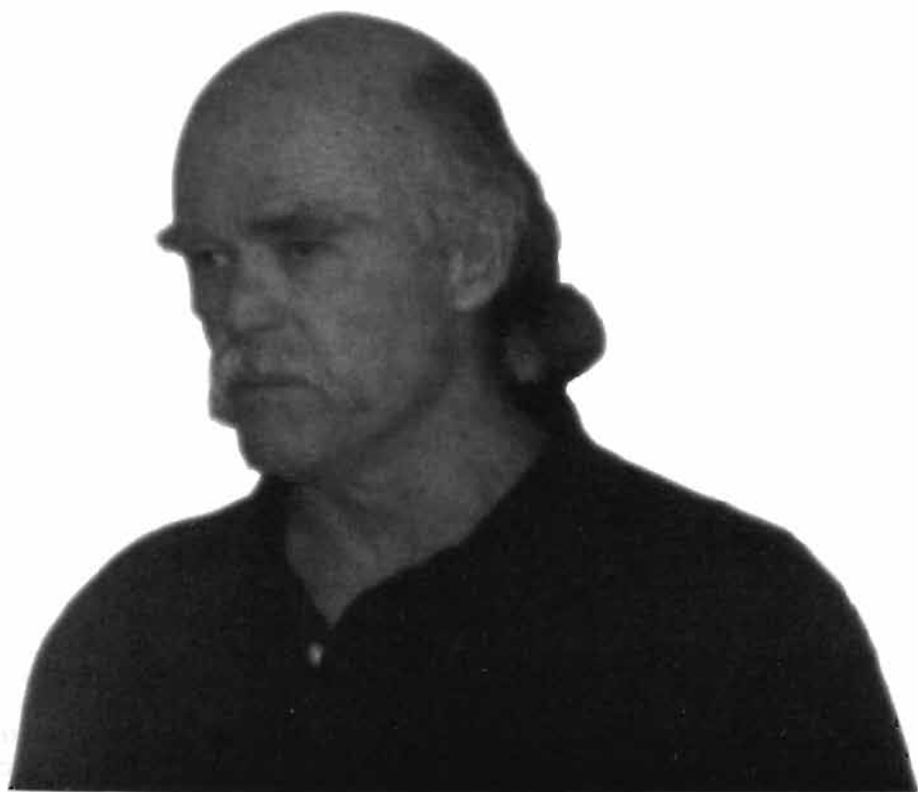
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Note: The affiliation and professional positions of the various participants were those current at the time of the meeting.

DEDICATION

This proceedings is dedicated to the memory of Dr. James Ellis from Colorado State University, whose untimely death is a great loss to the profession of rangeland sciences. Dr. Ellis was instrumental in developing the theory of non-equilibrium dynamics in rangelands, which has influenced contemporary rangeland policy in much of Africa and now Central Asia. We missed him in Lhasa, where he was to attend and present findings of pastoral research in Central Asia. We offer our sincere condolences to his family, friends and colleagues.



DR. JAMES ELLIS

OCTOBER 03, 1938 - MARCH 14, 2002

Foreword

Rangelands cover some 60% of the Hindu Kush-Himalayan and Tibetan Plateau region. Vast tracts of shrub, grassland, and sparse forests are the major sources of forage for free ranging native and domestic animals, as well as critical sources of wood, medicinal plants, wild food, fibres, and freshwater, and provide essential habitat for many endangered wildlife species. In terms of land area, rangeland resources encompass more territory than any other ecosystem in the Hindu Kush-Himalayas and are relied on by millions of farmers and pastoralists for their subsistence.

However, since rangelands are often remote, at high elevations, subject to harsh climates, and sparsely settled, they have largely been neglected by research and development agencies alike – not only in the Hindu Kush-Himalayan region but across the world. This neglect has been further exacerbated by institutional anomalies that generally allocate rangelands to forestry departments, for whom they are of marginal interest. In recent years this neglect of rangelands has started to change, although greater emphasis is still laid on the lower cultivated areas of mountain regions.

The Rangeland Programme at ICIMOD started from humble beginnings in 1995 with the hiring of its first rangeland management specialist. At this time, ICIMOD began to shift its focus to these largely ignored 'waste lands' of the high mountains. Strategies for range management and pastoral development were developed that focused on maintaining rangeland productivity, rehabilitation of degraded areas, protection and improvement of biodiversity, promotion of sustainable livestock production, and improving people's livelihoods by stimulating economic growth and increasing employment among the local population. Information was collected and analysed to provide the basis for informed discussion and development of appropriate and effective activities, and to feed into policy-level discussions.

With the generous support of the Federal Government of Austria, ICIMOD was able to expand its rangeland focus with the inception of the Regional Rangeland Programme (RRP) in 1999, a four-year endeavour to increase awareness of issues affecting the rangelands and the millions of inhabitants who rely on their resources to sustain a pastoral way of life, and to devise strategies to improve the quality of rangeland resources and the livelihoods of its inhabitants.

The International Year of the Mountains in 2002 provided an ideal opportunity to showcase the rangelands of the Hindu Kush-Himalayas. With the support of our long-standing partner in the Tibet Autonomous Region, the Tibet Academy of Agriculture and Animal Sciences (TAAAS), ICIMOD was able to bring a diverse array of professionals and members of community-based organisations together to share

ideas and strategies at a major event, "The Changing Face of Pastoralism in the Highlands of the HKH: A Strategy Workshop" held in Lhasa in May of 2002. The two volumes published here reflect the outcomes of this meeting and highlight our partnerships with the numerous institutions in the region that have helped to make the rangeland programme a success.

We hope that our partnerships will only grow from this point forward. ICIMOD is committed to support the positive efforts of the regional governments to serve their mountain communities through improved rangeland management. We have worked with our partners to develop the next phase of the Regional Rangeland Programme, as summarised in Chapter 6 of Volume I. We wish to continue our efforts in capacity building, communications and outreach, and policy support for integrated natural resource management and enterprise development through a focus on co-management so that our mountain rangeland communities can achieve cultural pride and prosperity in the decades to come.

We are pleased to be able to present this summary of discussions and collection of papers for all those concerned with helping the people of the rangelands to improve their livelihoods, and interested in the constraints and possibilities: development workers, policy makers, researchers, and many others. We are grateful to the participants for their excellent contributions; and to the editors for their superb work in summarising and presenting the results.

J. Gabriel Campbell, PhD
Director General

Acknowledgements

The Lhasa regional workshop was a challenging and exciting endeavour that would not have been possible without the participation of many players. It was an amazing experience to have the opportunity to interact with the diverse and committed group of individuals who attended this workshop. Participants from 17 countries – government officials, policy-makers, researchers, extension workers, representatives of both international and national NGOs, and members of community based organisations – came together to share experiences in an integrated manner. This is perhaps the first time that such a group has assembled on the Tibetan plateau and we all gained much insight. And we also had a most enjoyable time due to the warm hospitality of the Tibet Autonomous Region Government and its people. Special thanks to the TAR Vice-Governors, Ms. Tsering Drolka and Mr. Ja Bao, for their hospitality and support.

Many people worked hard to make this workshop a success. Primary among these are the staff of the Tibetan Academy of Agriculture and Animal Sciences (TAAAS) who took the lead in organising the logistical arrangements for the meeting. Special thanks go to the leadership of TAAAS – Lousang Danda, Chen Zhengrong, Wang Baohai, Li Baohai, Gu Maozhi, and Nyima Tashi. Their staff worked exceptionally hard for weeks prior to and during the meeting and their dedication was much appreciated. These include: Yang Yong, Shen Yuqiong, Wang Jianzhong, Liu Xiaohan, Pubu Ciren, Chen Yuxiang, Xiewei, Zhuang Yinzheng, Xiehui, Xiong Weiping, Liang Chunfang, Deji, Lu Yuling, Danzdong, La Bacang, Ji Quiying, Yixi Duoqi, Dawa, Luosang, Basang Ciren, and Laxi Lazong.

Many thanks go to the staff of ICIMOD for their assistance with international travel and financial arrangements, including the staff from the travel office, Rajen Upreti, Prativa Chhetri and Rishi KC, and from Finance, Kiran Shrestha. Jaya Lakshmi volunteered her time to assist with many emergency tasks. Special thanks to Dolkar Tsering, administrative assistant to the RRP, for her invaluable help for the many months prior to the meeting.

Translation services were provided by a number of excellent Chinese professionals. Without their assistance, we could not have involved many of the local community and government representatives. With good translation they were able to participate fully in an international forum. These include: Li Bo from the Center for Biodiversity and Indigenous Knowledge, Tan Jinzheng from the Sichuan Agricultural College, Mr. Song from Tibet University, Norbu Tsering from Tibet Academy of Social Sciences, Xie Hui from Simon Fraser University Canada, and Han Jianlin from the International Livestock Research Institute. Han Jianlin also played a crucial role in organising the schedule and speakers.

Last but not least, many thanks to the primary supporting organisations: the Federal Government of Austria and the European Community's INCO-DEV. Many additional organisations supported participants to attend the meeting, including: ICIMOD International Year of the Mountains (supported by SIDA); The Mountain Institute, Aga Khan Rural Support Programme, Pakistan; OXFAM China; US State Department Diplomacy Office; International Fund for Agricultural Development; Helvetas, Bhutan; The Bridge Fund; the Trace Foundation; Basic Human Needs Project (CIDA), Tibet; EU-Panam Project Tibet; Heifer Project International, China; Plateau Perspectives; Tibet Poverty Alleviation Fund; KunDe Foundation, Tibet; and WWF China.

Executive Summary : Volumes 1 & 2

In May 2002, ICIMOD and the Tibetan Academy of Agriculture and Animal Sciences organised an international workshop on 'The Changing Face of Pastoralism in the Hindu Kush-Himalayan (HKH)-Tibetan plateau Highlands', held in Lhasa, Tibet, as one of the contributions to the International Year of Mountains 2002. The meeting brought together more than 125 participants from 21 countries to build a mutual understanding of the realities of highland pastoralism in the HKH-Tibetan plateau: the factors that have contributed to marginalisation, the response, the challenges faced by development workers and policy makers, existing programmes and policies, and future policy strategies.

The proceedings of the Lhasa workshop and related material are presented here in two volumes. Volume One summarises the background of ICIMOD's RRP and the rationale and objectives of the workshop; provides detailed summaries of the presentations and working group discussions; and summarises the outcomes of the workshop, including conclusions drawn during a roundtable on rangelands conducted at the Bishkek Global Mountain Summit in Kyrgyzstan in October of 2002. Volume Two contains a selection of detailed papers by invited participants of the workshop.

Volume One is arranged as follows.

Chapter One describes ICIMOD's Regional Rangeland Programme (RRP) and provides the justification for the workshop, given the objectives of the RRP.

Chapters Two through Four provide summaries of the 28 invited oral presentations given during the first three days of the workshop and the results of the juniper research trials that were shown during a workshop field trip.

Chapter Two highlights integrated pastoral production research conducted in the HKH region. To date, much of the research related to rangelands that has been conducted in the HKH region has addressed mono-sectoral issues such as livestock husbandry or forage development. In this chapter, papers are presented that offer a more multi-disciplinary perspective, ranging from rangeland ecology and foraging behaviour to de facto customary arrangements for the management of pastures and other rangeland resources.

Chapter Three summarises eight papers that revolve around various aspects of integrated development approaches, keeping in mind the interconnectivity between technologies, markets, financial capital, and access to social services. Major themes include improving local community access to technological, financial, and social services, improving marketability of livestock products, and identifying alternative livelihoods, such as eco-tourism, as a means to augment pastoral incomes.

The presentations in Chapter Four describe participation as a driving force in the process of development and conservation initiatives. Participation here involves not only institutional building of the local communities, but also building the capacity of

government and non-government institutions to facilitate local learning processes and improve service delivery to pastoral communities that meets both local needs and society at large. The last two papers deal with grassland tenure policies as a basis for collaborative management, providing the security and incentive for communities to participate in rangeland improvement and development schemes. All papers emphasise that effective collaboration among local and government stakeholders requires a supportive extension, research, and policy environment that is adaptive to change and responsive to local needs, knowledge and aspirations.

Chapter Five provides a summary of the working group sessions conducted during days 5 and 6.

Chapter Six summarises the outcomes of the Lhasa workshop and the Bishkek Global Mountain Summit Rangeland Roundtable. It also provides the working strategy for the next phase of ICIMOD's Regional Rangeland Programme (2003-2006).

The workshop schedule and the contact information for contributing authors are given in Annexes one and two.

Twelve full papers are printed in Volume 2. These papers were selected because they provided additional information that could not be condensed into the summaries presented in the summary volume. Other papers by ICIMOD partners will be published in separate volumes by ICIMOD, and in external publications.

Acronyms and Abbreviations

ADB	Asian Development Bank
AEZ	Agro-ecological Zone
AHB	Animal Husbandry Bureau
AKRSP	Aga Khan Rural Support Programme
APPA	appreciative participative planning and action
CBO	community-based organisation
CPA	common property arrangements
CPR	common property regime
CPR	Center for Policy Research
CTNR	Chang Tang National Nature Reserve
GGR	Gilgit Ghizer region
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
HKH	Hindu Kush-Himalayas
ICIMOD	International Centre for Integrated Mountain Development
IFAD	International Fund for Agricultural Development
JDNP	Jigme Dorji National Park
KCC	Khangchendzonga Conservation Committee
KKH	Karakoram Himalaya
LRKB	Livestock and Rangeland Knowledgebase
ME	metabolisable energy
NGO	non-government organisation
NRM	natural resources management
PAR	participatory action research
PLA	participatory learning and action
PME	participatory monitoring and evaluation
PRA	participatory rural appraisal
PRC	People's Republic of China

RCP	Regional Collaborative Programme
RRA	rapid rural appraisal
RRP	Regional Rangeland Programme
SLC	Snow Leopard Conservancy
SME	small to medium sized enterprise
SNZ	Shenzha Nature Reserve
SPNP	Shey Phoksundo National Park
TAAAS	Tibetan Academy of Agriculture and Animal Sciences
TAR	Tibet Autonomous Region
TARFB	Tibet Autonomous Region Forestry Bureau
TMI	The Mountain Institute
TPAF	Tibet Poverty Alleviation Fund
TPIB	Tibet Plateau Institute of Biology
UK	United Kingdom
UNDP	United Nations Development Programme
WTO	World Trade Organization
WWF	Worldwide Fund for Nature

Contents

Foreword	
Acknowledgements	
Executive Summary	
Acronyms and Abbreviations	

1	ICIMOD's Regional Rangeland Programme and the Objectives of the Lhasa Regional Workshop	1
	Background	3
	Facilitating Change: The Regional Rangeland Programme (RRP) Phase I	6
	Objectives and Approaches of the Lhasa Workshop and the Bishkek Global Mountain Summit Rangeland Roundtable	13
	References	14
2	Integrated Research on Pastoral Production Systems	17
	Agropastoralism in the Northern Areas of Pakistan – A Systems Approach to Research	20
	<i>Iain Wright, Alan Duncan, Iain Gordon, Abdur Rahman, Raja Omer, Jurgen Clemens, Alison Hester, Sardar Raffique, Atiq-ur-Rehman, Ataullah Baig, Neil Chalmers, and Grant Davidson</i>	
	Productivity and Use of the Pasture Resources of the Northern Areas of Pakistan	22
	<i>Raja Omer, Alison J. Hester, Iain J. Gordon, Sardar M. Raffique, and Michael D. Swaine</i>	
	Availability and Utilisation of Stored Feed Resources and Their Impact on Livestock Production in the Agro-Pastoral System of Northern Highlands of Pakistan	24
	<i>Abdur Rahman, Alan J. Duncan, David W. Miller, Pilar Frutos, and Atiq-ur-Rehman</i>	
	Human and Economic Issues Associated with Livestock Production in the Northern Areas of Pakistan	26
	<i>Jürgen Clemens</i>	
	The Changing Pastoral Systems of Balochistan, Pakistan: Endangered Migration	28
	<i>A.W. Jasra and M. Afzal</i>	
	Balancing Pashmina Production and Wildlife Conservation in the Chang Tang of Tibet and Ladakh	30
	<i>Tsering Phuntsog, Norbu Tsering, Yeshi Dorje</i>	
	Pastoral Politics (Summary of Film)	34
	<i>Sanjay Barnela and Vasant Saberwal</i>	

	Medicinal Plants within the Context of Pastoral Life in the Village of Pungmo, Dolpo, Nepal	36
	<i>Yildiz Thomas, Yeshe Choden Lama, and Suresh K. Ghimire</i>	
	Community-based NRM among Kazakhs in the Tian Shan and Altay Shan Mountains of Xinjiang	38
	<i>Tony Banks</i>	
3	Integrated Development Approaches: Improving Access to Rangeland Technologies, Markets, Alternative Incomes, and Financial and Social Services	41
	Ecosystem Protection and Sustainable Development Strategies for Sichuan Grassland	44
	<i>Ze Bai</i>	
	Changing Perspectives in Livestock Production	46
	<i>John M. Chesworth</i>	
	Towards the Green Belt in Southern Xizang – Initial Results of An Applied Research Project to Rehabilitate Degraded Rangelands	48
	<i>Sabine Miehe, Georg Miehe, and Katja Koch</i>	
	Improved Forage Trials and Grass Seed Development in the Tibet Autonomous Region	50
	<i>Chen Yuxiang</i>	
	Nomads and Markets: Challenges of Decentralised Production – The Case of Yak Cheese	52
	<i>Ethan Goldings</i>	
	Ecotourism Opportunities for Pastoralists; Experiences from Ladakh and Sikkim, India	53
	<i>Nandita Jain</i>	
	Integrated Rural Development in the Tibet Autonomous Region (TAR), China	55
	<i>Nyima Adack and Robert Campbell</i>	
	Where there is No Doctor: Building the Capacity of the Himalayan Amchi to Serve Pastoral Communities	59
	<i>Tenzing Bista, Gyatso Bista, and Yeshe Choden Lama</i>	

4	Enabling Institutional and Policy Change to Support Collaborative Pastoral Development and Rangeland Conservation	65
	IFAD's Experience in Supporting Community Based Livestock and Rangeland Development	68
	<i>Ahmed E. Sidahmed and Antonio Rota</i>	
	Community-based Rangeland Management in the Alpine Meadows of Maqu County, Gansu, PRC	71
	<i>Du Guozhen</i>	
	Integrated Application of Technical Skills and Participatory Approaches in Rangeland Improvement in Pastoral Areas	73
	<i>Zhao Qun, Ma Jianyun and Niang Maojia</i>	
	A Community-based Approach to Mitigating Livestock-Wildlife Conflict in Ladakh, India	75
	<i>Rinchen Wangchuk and Rodney Jackson</i>	
	How Much Participation? Experiences with Participatory Approaches in Pastoral Settings	77
	<i>Wolfgang Bayer and Ann Waters-Bayer</i>	
	Integrating Yak-herding Communities into Conservation and Resource Management Planning Processes in Jigme Dorji National Park, Northwest Bhutan	79
	<i>Tshewang R. Wangchuk</i>	
	Holistic and Community-based Approaches to Building Sustainable Livelihoods for Herders in Mongolia	81
	<i>Ayurzana Enkh-Amgalan</i>	
	Pastoralists, Government, and Natural Resources in Iran: Organisational Learning in the Forest and Range Organisation	83
	<i>Mohammed H. Emadi</i>	
	Tenure and Management Arrangements for China's Grassland Resources: Fieldwork Findings and Legal and Policy Recommendations	85
	<i>Brian Schwarzwald, Zheng Baohua, Li Ping, Su Yufang, and Zhang Lichang</i>	
	Nomad People Should be the Major Concern in Grassland Policy - Case Study from the Northeastern Tibetan Plateau, China	87
	<i>Yan Zhaoli, Wu Ning, and Camille Richard</i>	

5 The Working Group Sessions 91

Working Group #1: Demonstration of IFAD's Livestock and Rangeland Knowledgebase	94
<i>Ahmed Sidahmed</i>	

Presentation of IFAD's Livestock and Rangeland Knowledgebase (LRKB)	94
<i>Ahmed Sidahmed</i>	

Working Group #2: What Can We Learn from a Systems Research Approach to Integrated Mountain Development?	96
<i>Iain Wright, Iain Gordon</i>	

Working Group #3: Rangeland Conservation on the Tibetan Plateau	98
<i>Ganesan Balachander</i>	

Conservation In the Chang Tang - WWF's Conservation Activities	98
<i>Dawa Tsering</i>	

Pastoralism and Wildlife Conservation In the Chang Tang Nature Preserve .	100
<i>Joseph L. Fox, Drolma Yangzom, and Ingela Flatin</i>	

One Yak, Two Cranes Project, Tibet Peak Enterprise Programme, TMI	104
<i>Nandita Jain</i>	

Working Group Exercise: Identifying Issues and Strategies Regarding Conservation on the Tibetan Plateau	104
--	------------

Working Group #4: Appropriate Institutional Arrangements and Policies for Community-based Rangeland Management	107
<i>Tony Banks, Tan Jingzheng</i>	

Resource Tenure Models for Rangeland Improvements	107
<i>Camille Richard and Tan Jingzheng</i>	

Working Group Exercise: Defining An Enabling Environment for Co-management Arrangements	109
--	------------

6 Working Group #5: Integrated Research and Extension Needs for Participatory Rangeland Management and Pastoral Development	111
<i>Wolfgang Bayer, Li Bo</i>	

Strategic Innovations for Improving Pastoral Livelihoods In the Highlands of the Hindu Kush-Himalayas	113
--	------------

7 Annexes	125
------------------------	------------

Annex 1: Agenda	127
------------------------------	------------

Annex 2: Contact Information for Contributing Authors of Invited Oral Presentations	133
--	------------

Contents of Volume II

Community-based Natural Resource Management Among Kazakhs In the Tian Shan and Altay Shan Mountains of Xinjiang

Tony Banks

Tenure and Management Arrangements for China's Grassland Resources: Fieldwork Findings and Legal and Policy Recommendations

Brian Schwarzwald, Zheng Baohua, Li Ping, Su Yufang, and Zhang Lichang

Resource Tenure Models for Rangeland Improvements – Discussion Paper for Working Group on 'Appropriate Institutional Arrangements and Policies for Community-based Rangeland Management'

Camille Richard and Tan Jingzheng

IFAD's Experience In Supporting Community Based Livestock and Rangeland Development

Ahmed E. Sidahmed and Antonio Rota

How Much Participation? Experiences with Participatory Approaches in Pastoral Settings

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Zhao Qun, Ma Jianyun and Niang Maojia

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Rinchen Wangchuk and Rodney Jackson

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Yildiz Thomas, Yeshe Choden Lama, Suresh Ghimire

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Tshewang R. Wangchuk

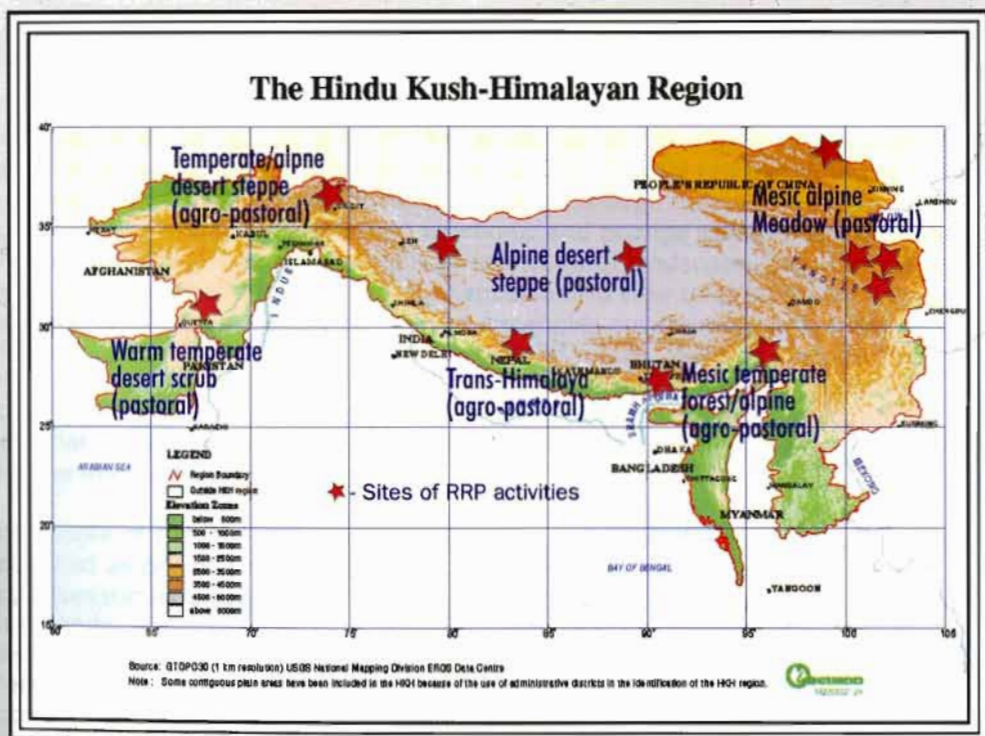
Pastoralists, Government, and Natural Resources In Iran: Organizational Learning In the Forest and Range Organization In Iran


Mohammad H. Emadi



**Participants at the International Workshop on
'The Changing Face of Pastoralism in the Hindu Kush-Himalayan (HKH) -
Tibetan Plateau Highlands'
held in Lhasa Tibet, May 12-19, 2002**

1 ICIMOD's Regional Rangeland Programme and the Objectives of the Lhasa Regional Workshop





Cover photo: Map of the Hindu Kush-Himalayan region showing the sites of ICIMOD's Regional Rangeland Programme activities (*from the presentation by Camille Richard*)

ICIMOD's Regional Rangeland Programme and the Objectives of the Lhasa Regional Workshop

Background

More than 60% of the Hindu Kush-Himalayan and Tibetan plateau region consists of rangeland ecosystems and is much like rangelands of other parts of the world: a marginal resource, naturally low in productivity, and highly variable in terms of water and forage availability. These rangelands support a large livestock industry, accommodate important watershed functions, and provide valuable and biologically diverse resources. They also reflect a diverse cultural landscape, concurrently shaped by physical forces and human use. It is important to view rangelands not only as a resource to sustain livestock, but also as a complex environment with a diverse array of amenities and possibilities and a rich cultural milieu. However, despite the importance of rangeland resources to local and national economies, most government and development agencies have neglected them, even though the potential of rangelands to contribute significantly to economic development and biodiversity conservation is high.

The people of the HKH rangelands region have sustained themselves in what can be described as one of the harshest landscapes on earth, relying on extensive and opportunistic mobility of livestock to procure forage from native grasslands and shrublands, and cultivation of a rich knowledge base, including elaborate mechanisms, to collectively manage resources. These communities increasingly find themselves at the fringes of modern society and the development process. Their economy and way of life, and the environment upon which they depend, are poorly understood; they struggle to make ends meet in a world that increasingly sees their way of life as 'backward' and 'irrational'. Yet, these communities have proven themselves to be quite resilient and have adapted to change when swayed and constrained by the world around them. Such indigenous¹ systems are especially apparent across marginal dryland regions of the world as an adaptive strategy to survive a harsh and uncertain environment. Despite the rhetoric to the contrary, extensive livestock grazing and the diverse array of common property regimes (CPRs) that manage human and livestock movement have been shown to help maintain rangeland health, especially if pastoralists can maintain a degree of mobility that fosters optimal use of pasture resources (Steinfeld et al. 1997; Naimen-Fuller and Turner 1999). Fortunately many local institutions are still in place that regulate spatial and seasonal access to pasture resources in the remote rangeland regions of the Himalayan and Tibetan plateau (Goldstein and Beall 1990, Rai and Thapa 1993, Ura 1993, Richard 1994, McVeigh 1994, Saberwal 1996, Wu 1997).

¹ In this discussion, the term 'indigenous' refers to a dynamic process of local innovation in natural resource management vs. long-term ritualistic or static 'traditional' practices (Gilmour and Fisher 1991).

Despite their skills, pastoralists of the HKH, like those throughout the world, face a number of growing challenges that constrain them from exercising their full traditional rights and practices (Miller 1995, Wu and Richard 1999, Naimen-Fuller and Turner 1999). These include natural factors such as desiccation of pastures due to changing climate, and significant loss of livestock during severe drought or excessive snowfall events. In addition, pastoralism as a way of life is increasingly challenged due to a number of socioeconomic factors, such as: regional population increase; encroachment; generally poor infrastructure, social services, and market access for mobile communities; increasing education and employment opportunities outside the pastoral sector; and a shift to a more monetary economy. Government policies and development programmes also significantly influence the way local pastoral communities access and manage rangeland resources. Though often well-meaning, these programmes are driven by a general disdain for the pastoral way of life and a poor understanding of the efficacy of pastoral production systems and rangeland ecology amongst policy makers, who mainly hail from low lying agricultural areas. Applied in the name of 'sustainability', these policies have often resulted in outcomes that were the opposite of what was originally intended, leading to increased environmental degradation through the reduction of livestock mobility and the marginalisation of pastoral communities through heightened economic and social risks (Naimen-Fuller and Turner 1999). Such actions, depending on the geopolitical environment, include:

- appropriation of the more productive pastures (perceived as 'vacant' land) by the state for crop cultivation, where investments and political authority are vested in sedentary agricultural populations;
- closure of land for 'protection' resulting in loss of access to high quality pastures;
- separation of the legal ownership of natural resources from their users, leading to a breakdown in the indigenous institutions for managing natural resources; and
- centralisation of social and technical services through the settlement of nomadic communities, causing concentration of livestock and overgrazing near settlements.

A Co-Management Approach for Rangelands

Given these alarming trends among pastoral communities, the question arises whether extensive pastoralism can be maintained as a sustainable livelihood option. However, the integrity of rangeland ecosystems, from both an ecological and economic perspective, depends on it, especially in semi-arid environments. There is a critical need to explore innovative institutional arrangements that can favour effective and extensive rangeland management. This will require a high degree of collaboration among a variety of stakeholders, from the local herder to the policy maker. It will require policies and programmes that are flexible and responsive to local needs and aspirations, in an environment of mutual respect and effective organisational cooperation. Such an environment will help to build and support the social capital necessary for effective community-based conservation and development initiatives (also referred to as 'co-management'). This situation is far from the current reality.

'Co-management' is defined as "a situation in which two or more social actors negotiate, define, and guarantee amongst themselves a fair sharing of the management functions, entitlements, and responsibilities for a given territory, area, or set of natural resources" (Borrini-Feyerabend et al. 2000). Key actors are usually government bodies and local communities. Co-management involves: 1) the process for stakeholders to make decisions and exercise control over resource use; and, 2) the

actual management arrangements that are based on a set of negotiated rights and privileges (tenure) that are locally acceptable and legitimised by the government (Ingles et al. 1999). Given this definition, it is important to understand that participation is not a means to achieve some end, but rather, entry points such as forage development or livestock improvements are merely a means to achieve participation of key stakeholder groups, principally the local communities. In other words, any co-management support programme should be striving to create a self-sustaining partnership of stakeholders able to identify and address development issues as they arise. The present strategy document is about an approach, rather than a prescription for site-specific activities, which instead arise out of the process itself.

Facilitating an effective collaborative approach, first requires a theoretical foundation that legitimises pastoral mobility and collective action in both environmental and economic terms. New global perspectives are emerging regarding rangeland ecosystems and pastoral production practices, primarily the notion that many semi-arid rangeland ecosystems function as non-equilibrium systems, and that Western precepts of livestock and range development are often not appropriate. In addition, traditional pastoral production practices are often found to be efficient and well-adapted to the prevailing environment, having evolved as rational responses for utilising the range resources available to the herders. Those mandated to work with pastoral communities need effective training in contemporary rangeland and social science theory and assessment approaches to better gauge the nature of these agro-ecosystems.

A far greater challenge is developing working policy implementation strategies that support collaborative management approaches. Primary constraints to such an approach are the harsh environment and relatively slow response time with resource improvements, the incompatibility of many land use policies with a diverse, heterogeneous landscape, and a bureaucracy untrained and unable to cope with site-specific and diverse concerns at the local level. This is only accentuated by the often rigid mindset of government bureaucracies and the lack of coordination among relevant but discordant organisations that are mandated to work in pastoral areas. Strategies for overcoming such constraints require a multi-tiered approach, one in which varied government actors become more engaged in a process of critical reflection on process, and immerse themselves in development implementation. This invariably will bring about changes in attitudes, allowing strategic 'change agents' within organisations to incrementally transform the way governments work. This can best be achieved under the following conditions.

- Sound theoretical foundation – recognition of the potential of opportunistic range management strategies with their principles of mobility and flexibility instead of rigid stocking at pre-determined carrying capacities
- Functional and empowered pastoral institutions – to facilitate greater participation in development and conservation initiatives in rangeland ecosystems
- Coordinated policy and development efforts – endorsement and practice of integrated natural resource management approaches to pastoral development and biodiversity conservation
- Responsive donor support – flexible financing and longer-term time frames for pastoral development projects on the part of donors and central government planners

Facilitating Change: The Regional Rangeland Programme (RRP) Phase I

The International Centre for Integrated Mountain Development (ICIMOD) has been attempting to address some of these knowledge and methodological challenges through its Regional Collaborative Programmes (RCP) I and II, with the initiation of a rangeland focus in 1995. Outcomes from the early phase (1995-1997) were:

- a better understanding of range management issues in the HKH countries, through workshops, conferences, field visits, interactions, and training courses;
- increased awareness on range management in connection with wildlife and biodiversity conservation;
- greater attention from potential donors for funding of a more focused programme;
- setting of the groundwork for analysis of rangeland dynamics and development, implemented during RCP-II.

The major highlight during the RCP-II Rangeland Activity (1998-2002) has been the implementation of the Regional Rangeland Programme (RRP) Phase I, initiated in 1999. The RRP has served as an umbrella for all the projects incorporated in Activity 14, Management of Rangelands and Pastures, a component of the RCP-II, in terms of framework and approach.

Goals and Objectives of RRP-I

The long-term goal of the Regional Rangeland Programme (RRP) is to help reduce and eradicate poverty among rangeland dependent mountain people and to improve the productivity of rangeland ecosystems in the Hindu Kush-Himalayan – Tibetan plateau region.

The primary objectives of the first phase of the RRP were:

- to improve the knowledge base on rangeland ecosystems;
- to develop and test new technologies for improved rangeland and forage management;
- to strengthen national and local institutional mechanisms for managing rangeland resources and pastoral development;
- to promote regional collaboration and information sharing; and,
- to develop or reinforce appropriate policies for improved rangeland management and pastoral development.

Long-Term Conceptual Framework and Strategy for the RRP

Given the complexity of rangeland ecosystems and management issues, ICIMOD has focused primarily on developing a process to support co-management initiatives, a long-term endeavour that requires an interdisciplinary conceptual framework, which we use to guide our programming. The RRP (both past and future phases) is thus focusing on the linkages between pastoralists, the environment, the market, and government policies and development plans as a basis to build long-lasting partnerships for improving development and policy support. Figure 1 shows a model of the conceptual framework we have developed to help us keep this interdisciplinary focus so that we address such issues in our research, capacity-building, and networking activities.

A complex array of factors influence how local pastoral communities use and manage their resources, ranging from biophysical limitations to geo-politics, and need to be elucidated before any intervention can be made (identified through diagnostic studies). Objectives of a project must be based on perceived needs and environmental realities identified during initial studies. Communities need secure access to resources, information, and marketable options for improving productivity and livelihoods. Pastoralists are likely to reject innovations that put their livelihoods at risk due to their uncertain socioeconomic and climatic environments. Acceptable innovations will need to be introduced in ways that empower stakeholders and encourage collaborative decision-making.

Figure 1 provides insight into the characteristics of key stakeholder groups in a co-management process: local communities, government line agencies, NGOs, private businesses, research institutions, and policy-makers at various levels (stakeholder and organisational analyses). What is the nature of 'community' – their organisations, social norms and rules, individual managerial and technical skills, systems of decision-making and collective action, and their access to financial resources and information? A good series of diagnostic studies should give a realistic idea of local community priorities and a solid idea of institutional capability, at multiple management levels.

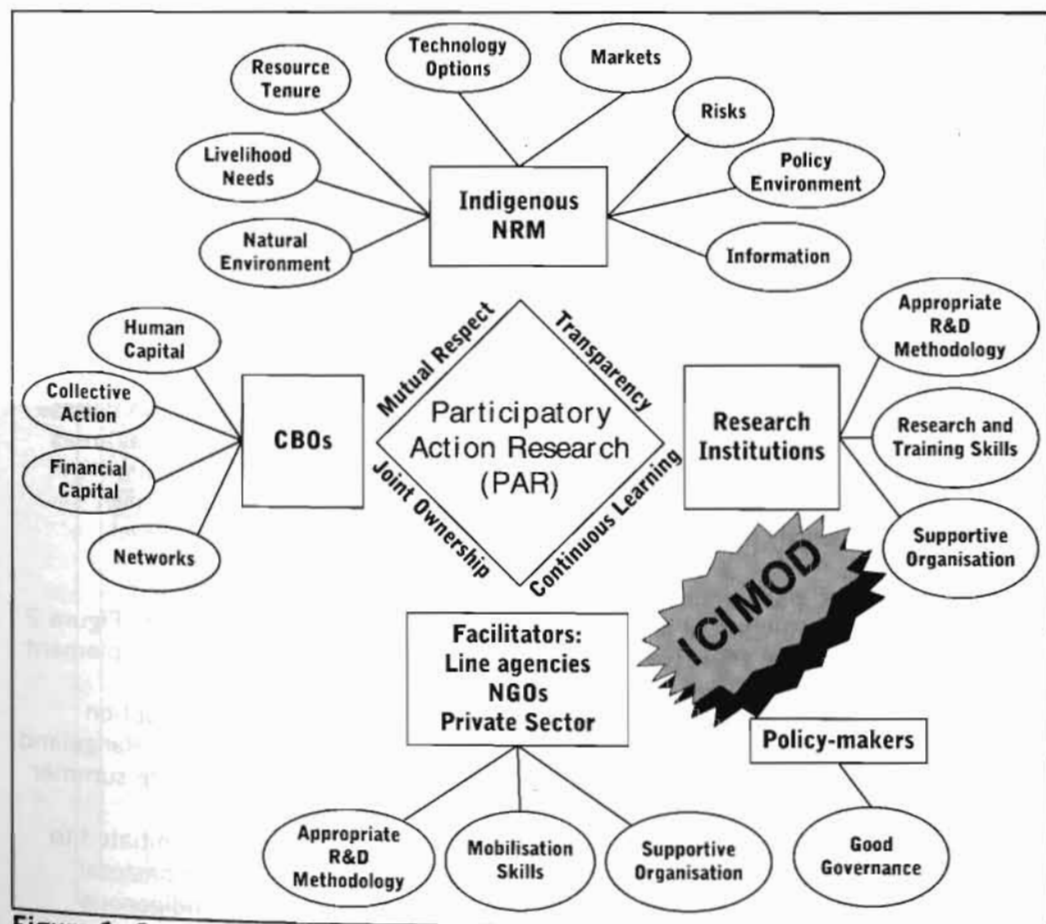


Figure 1: Conceptual Framework for the RRP I and II

The staff who facilitate these programmes need good organisational support and adequate funding to be able to deliver services properly to rural communities. These change agents are the target group of ICIMOD's RRP capacity building programme. What skills and attitudes do facilitators possess in terms of appropriate participatory research and development methodologies? Do extension staff work in a supportive organisational environment that allows flexibility in delivery of services to rural communities with long-term planning and funding mechanisms in place? Are they also supported by relevant and timely inputs from research personnel who also possess good participatory skills and methodologies? These organisations need to work in a complementary way so that they can be called in to perform particular tasks identified by other organisations, through an effective network of information exchange and collaborative planning.

To support this type of multi-level learning and networking requires policy makers who are aware of and respect the needs of local people and can adjust policies to accommodate equitable innovations. And what role does a supporting organisation such as ICIMOD play to develop necessary skills and support collaborative processes? If the proper conditions are lacking, what capacity building measures are needed to build such skills among the various actors?

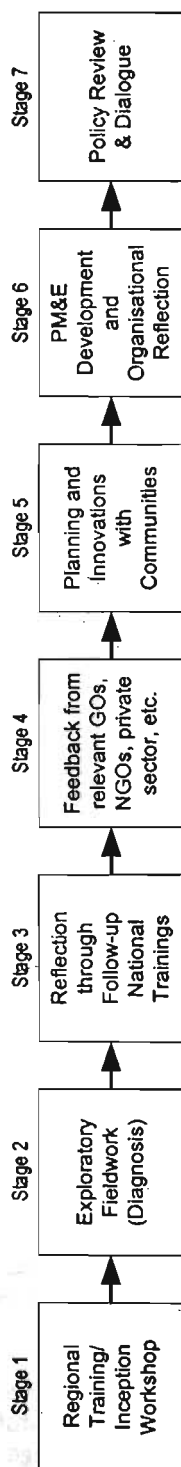
Implementation Strategy for the RRP-I and Beyond

Any co-management scheme requires a dynamic inquiry and planning process that stresses mutual respect, transparency, joint ownership of information generated, and continuous learning through group reflection and decision-making among the identified stakeholders. Participatory action research (PAR) is a systematic and collaborative process involving iterative cycles of planning, implementation, observation on the outcomes of actions, and group reflection on the assumptions and attitudes applied to analyse resulting situations (Greenwood and Levin 1998). This process leads to the next phase of fine-tuned planning, action, observation and reflection. The methods used in PAR can be the same as those used in conventional research. The difference lies in how the methods are utilised, a participatory paradigm versus extractive. Thus, PAR is not a methodology; rather, it is an approach to research that aims to democratise knowledge generation (Greenwood and Levin 1998). It is appropriate to use when the issues are complex and people have diverse opinions but do not know where to begin to address them such as in pastoral areas where common property arrangements are still the norm (Fisher 2001). This approach encourages participants to reflect on project outcomes and their own assumptions to identify possible best practices to implement at the local level.

ICIMOD has formed partnerships with institutions concerned with rangeland conservation and development in Pakistan, India, China, Nepal, and Bhutan. Figure 2 illustrates the long-term PAR strategy that ICIMOD has been employing to implement the RRP.

- **Stage 1: Inception PAR Training.** The project began with a regional inception workshop and training programme in 'Participatory Action Research in Rangeland Management', which resulted in six action plans for initiation in the late summer of that year.
- **Stage 2: Diagnostic Studies.** Follow-up diagnostic case studies were initiated to identify the socioeconomic and environmental conditions that affect pastoral communities, specifically looking at community diversity, gender, indigenous knowledge, resource tenure, and local aspirations.

Participatory Action Research Strategy for the RRP

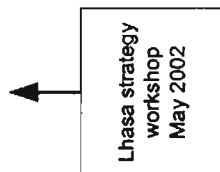


Where are We?

RRP Phase I

RRP Phase II

Complimentary Regional Activities:



Professional Networks

Exchange Visits

Figure 2: PAR Strategy for RRP Phase I and II implementation

- **Stage 3: National level trainings.** The PAR process continued into 2000 and 2001 with the next phase of national level trainings and reflections on the outcomes of the diagnostic studies. In some sites, trainings were conducted for the local research team.
- **Stage 4: Feedback among stakeholder groups.** Further reflections on the results and process of the studies and trainings, and the subsequent action plans, have been presented to government line agencies, NGOs, and private sector representatives, whose feedback is being incorporated into follow-up plans. Partners also presented their findings in international forums held in the region (2000 and 2002).
- **Stage 5: Local Site Planning.** In some sites, ICIMOD partners have begun a planning process to initiate projects with pilot communities. Entry points for innovation have been (and will be) based on the priorities set by the local stakeholder groups and include pasture development, livestock marketing, eco-tourism planning, and water development, varying from site to site. These action plans form the basis for Phase II innovation testing, which has not yet been initiated. These demonstration activities will be initiated by trainers trained in 'Participatory Assessment and Planning for Co-management of Rangelands' in Phase II.
- **Stage 6: Participatory Monitoring and Evaluation.** The next stages involve actual project implementation of community-based plans and development of a participatory monitoring and evaluation (PME) system to allow stakeholders to reflect on the outcome of innovations and the process employed. To date, no participatory monitoring and evaluation exercises have been conducted.
- **Stage 7 and beyond: Policy Dialogue.** As experience is gained, it is envisioned that partners will continue to network with policy-level bodies in order to guide decision making at the macro-level. By this time, ICIMOD's goal is to turn over the process to those whom it benefits, local communities and the organisations that are there to serve their needs and aspirations, to continue as they deem necessary.

RRP Phase I Outcomes

Since its inception, the project has moved from focusing on assessment, towards a process of continuous learning and collaborative decision-making among stakeholders, from local herders to policy makers. A crucial operational long-term goal of the project is to help create an environment where stakeholders (especially ICIMOD partners) can take over the co-management process initiated. The project encourages this by building the capacity of partner institutions to conduct participatory research with relevant stakeholders, through formal training, research grants, and networking opportunities, as a grounding for policy advocacy. This approach has facilitated a better understanding of the socioeconomic and environmental realities of rangeland areas and has generated a greater awareness of integrated and participatory approaches among a variety of actors, from local communities to researchers and politicians.

To date, the primary achievement has been of a more intangible nature: a change in attitude and management style among the staff of participating institutions (research, extension, and administrative), forming the cadre of 'change agents'

required to foster a transformation in the way government agencies think and work. A co-management process cannot proceed until government institution staff and decision-makers have the proper mindset for sharing power, and this can be a long and tedious change to bring about. But now that this is happening in some sites, the subsequent steps in our strategy are beginning to fall into place.

Specific outcomes include the following.

- 1) Community-led efforts for improved rangeland management. Locally driven initiatives have included one in Northwest Yunnan, China, to test and develop native forage species, initiated in spring 2001. The State Key Laboratory of Arid Agro-ecology, China, has used the new approaches to improve implementation of its Oxfam supported development project in Maqu County, Gansu, by basing rangeland management plans on the indigenous knowledge of the herding community. They are also using indigenous indicators to challenge the scientific assumptions for determining the carrying capacity of pastures. Other sites are merely in an assessment and planning stage.
- 2) Improved integration of participatory approaches within operational plans of partner institutions. The staff of these institutions have prepared action plans to incorporate participatory approaches in their own projects, as well as ICIMOD sponsored ones.
- 3) Initiation of institutional transformation within some partner institutions leading to improved organisational performance. For example, the seed has been planted for further organisational change to facilitate participatory rangeland management in institutions such as the Sichuan Grassland Institute. This should lead to improved performance, more networking, and ultimately policy change in Sichuan.
- 4) Cost sharing and joint organisation by collaborating institutions for research and training events. Many collaborating institutions have shared the costs of research and training events, and have organised many of these activities.
- 5) Contribution to national level policy dialogue. Various forums have been organised to provide feedback to decision-makers about the outcomes of training events and diagnostic studies. For example, the Sichuan Provincial Animal Husbandry Bureau, China, has shown strong interest in supporting the action plan prepared by ICIMOD's Sichuan partner group. The Balochistan government (west Pakistan) has pledged to increase focus on livestock and rangeland issues and to help support participatory research with local nomadic communities. The Ladakh coordinating partner has used the participatory tools learned to conduct planning meetings in the nomadic areas of the Ladakh Chang Tang. These plans were received favourably by the Ladakh Hill Council and are being considered for funding.
- 6) International level networking to share best practices in pastoral development and rangeland management. ICIMOD sponsored a special session during the Third International Congress on Yak in September of 2000 on integrated development approaches. It also coordinated this international workshop in Lhasa, 2002, to present working strategies for pastoral development in the HKH, which contributed to the resolution prepared at the Bishkek Global Mountain Summit.

Lessons Learned

It is a given fact that this programme began with an outside agenda and budget (to bring about a paradigm shift toward participatory research within partner institutions). However, the assumption is made that as the PAR process builds, levels of participation increase among various stakeholders and the initial partner organisations assume more of a role as facilitator. The fundamental question remains as to how the partner institutions transfer ownership of the action research process to those groups most affected, in both managerial and financial terms?

Although there have been many positive outcomes, a few difficulties have been encountered. There are a number of pitfalls that many supporting organisations encounter when implementing co-management schemes, and ICIMOD is no exception. However, these experiences provide invaluable guidance for the implementation of subsequent phases of the RRP.

Key lessons learned during implementation of the RRP Phase I include the following.

The need for an initial conceptual framework and strategy to guide early planning stages and budgeting of the project. The conceptual framework and strategy outlined in Figures 1 and 2 have been developed through trial and error during the first three years of the RRP, and result more from hindsight than a clear planning process at the beginning of the project. Inadequate budget was allocated for meetings, planning, and monitoring. Management agreements can take many rounds of negotiation, especially when many stakeholders are involved and communities are highly heterogeneous in economic and social characteristics.

Proper monitoring and follow-up of project activities. Because ICIMOD is not a direct development organisation, we generally do not conduct projects at the local level, and thus find it difficult to provide the mentoring for partner institution 'change agents' during their field work. In addition, the project was inadequately staffed within ICIMOD, making it difficult to maintain consistent communication with partners. Without proper guidance, some partners have found it difficult to understand the new approaches being promoted by the project and only a few have easily adopted the concept of stakeholder participation, mainly due to past experience. As a result, some well-meaning intentions to conduct participatory activities have not materialised.

Remoteness of rangeland ecosystems in the HKH. Another limiting factor is that rangeland ecosystems, especially in the HKH, are remote, extensively used, and travel can be time-consuming and costly. This significantly increases the costs to conduct pilot activities, which has hindered the demonstration component of this project.

Commitment of partner institutions. Partner organisations must be willing to engage in a process of joint learning and transformation to improve their ability to deliver services to local communities. Also, no programme will be successful without a committed partner who takes the lead in facilitation at both local and state levels. A supporting organisation such as ICIMOD simply cannot play this role effectively. In our experience, the sites where we have had the greatest success are where we had a good local organisation that followed up on outcomes of diagnostic studies, the partner organisation and their affiliates had the trust of the local pilot area communities, the initiative was supported by key local decision-makers, and where financial support was pledged by either local governments or donors.

Building on regional experience. Sites without the above characteristics will not inevitably fail. These areas require more follow-up and opportunities to learn through exchange visits with stakeholders from other more successful trial areas. ICIMOD as a regional organisation is suited to provide these networking opportunities and has contributed to the spread of many technologies and institutional innovations in the region. This comparative advantage should be capitalised upon in the next phase of the programme.

Partnership with other support organisations. Due to the high cost of pilot site demonstration and the position of ICIMOD as a regional networking and knowledge sharing organisation, ICIMOD should partner with other institutions (strategic alliances) that are more directly mandated to support research and demonstration trials at the local level. In this way, ICIMOD can more effectively provide strategic services, mainly regional capacity building, networking and policy advocacy, while the partner supports more bi-lateral project-based activities. During the implementation of the RRP, the sites which are furthest along are the ones where this critical financial and technical support exists, with ICIMOD serving in more of an advisory position.

Objectives and Approaches of the Lhasa Workshop and the Bishkek Global Mountain Summit Rangeland Roundtable

ICIMOD and its partners in the RRP felt that there was an urgent need to bring diverse players together, from a variety of disciplines and backgrounds, to build mutual understanding about the realities of highland pastoralism in the HKH-Tibetan plateau region. What factors have contributed to the marginalisation of pastoral peoples? How have they responded? What are the challenges faced by development workers and policy makers for bringing pastoral communities into the 'mainstream'? What programmes and policies have helped them adapt to modern forces of globalisation? What are future policy strategies that legitimise local knowledge and collective action in the management of rangeland resources?

ICIMOD and its partner organisation in Tibet, the Tibetan Academy of Agriculture and Animal Sciences (TAAAS), jointly organised this international workshop, 'The Changing Face of Pastoralism in the HKH-Tibetan plateau Highlands', in Lhasa, Tibet Autonomous Region (TAR), China, on May 12-19, 2002, as part of the International Year of the Mountains, 2002. This workshop was originally intended to serve as a regional forum for participants to review and synthesize outcomes of ICIMOD's Regional Rangeland Programme. ICIMOD and its partners decided to broaden the scope of the workshop to include more of an international audience that would gather to not only review and synthesize, but also to share ideas and to develop strategies to address the above questions and issues.

The specific objectives of the Lhasa workshop were the following:

- 1) to increase understanding of the current state of pastoralism in the highlands of the Tibetan plateau;
- 2) to celebrate the knowledge and strengths of mountain rangeland communities;
- 3) to highlight success stories of development programmes and policies that have fostered sustainable pastoral livelihoods in a world of rapid change; and
- 4) to collectively devise working strategies for future innovations in pastoral development and rangeland conservation.

Invited oral presentations covered a variety of topics relevant to pastoral development and rangeland conservation, including the following:

- pastoral production systems research,
- resource tenure policies and impacts,
- alternative livelihoods for pastoralists (such as marketing of niche products, medicinal plants, and eco-tourism),
- successful participatory approaches to pastoral development and conservation of rangelands,
- institutional strengthening of social services in remote pastoral areas,
- improving organisational performance of government agencies, and
- institutional and policy models for co-management of rangelands in China and Mongolia.

These were supplemented by poster presentations that participants used to convey topics of interest to each other and as a basis for person-to-person discussions.

In addition, a number of working groups were conducted on the following topics:

- demonstration of the International Fund for Agricultural Development's (IFAD) Livestock and Rangeland Knowledgebase,
- development of an agro-pastoral conceptual model for the Agri-Karakorum project, Northern Areas, Pakistan,
- rangeland conservation on the Tibetan plateau,
- appropriate institutional arrangements and policies for community-based rangeland management,
- integrated research and extension needs for participatory rangeland management and pastoral development,
- international science and technology cooperation under the European Commission's research programme.

Field visits included a cultural fair in the pastoral region of Damxiong County north of Lhasa and a juniper restoration site adjacent to Drepung Monastery near Lhasa.

As a follow-up to the Lhasa meeting, ICIMOD conducted a roundtable discussion at the Bishkek Global Mountain Summit. Examples of policy approaches in TAR, China, and Mongolia were presented, along with a summary of outcomes from the Lhasa meeting. Outcomes and conclusions of this latter meeting are incorporated into Chapter 6.

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2 Integrated Research on Pastoral Production Systems



Cover photo: taken from the Special Technical Bulletin on Livestock, Fodder, Pastures and People, An Integrated Study in the Karakoram Region of Pakistan - compiled by Alan Duncan, MLURI, UK, and published by ICIMOD in September 2001 (*Juergen Clemens*)

2

Integrated Research on Pastoral Production Systems

In this chapter, we provide summaries of the oral presentations at the Lhasa workshop related to integrated pastoral production research. To date, much of the research related to rangelands that has been conducted in the Hindu Kush-Himalayan region has addressed mono-sectoral issues such as livestock husbandry or forage development. The papers presented in this section offer a more multi-disciplinary perspective, ranging from rangeland ecology and foraging behaviour to *de facto* customary arrangements for the management of pastures and other rangeland resources.

The first four presentations summarise research conducted in the Gilgit region in the Northern Areas of Pakistan coordinated by the Macaulay Land Use Research Institute, UK, in collaboration with the Aga Khan Rural Support Programme. These papers address the forage and livestock situation in the light of current socioeconomic factors that are influencing farmers' behaviours and resource use patterns.

The following two presentations summarise research work supported by ICIMOD's Regional Rangeland Programme and will be published in detail separately. Abdul Wahid Jasra from the Pakistan Agricultural Research Center presented findings from a socioeconomic study of pastoralism in Balochistan. He discusses the changes in practices that have evolved in response to varying socioeconomic and environmental pressures in the region including: the Afghan wars, drought, increasing exploitation of ground water for tube well irrigation, and a lack of consideration for migratory communities by the Balochistan government. A brief overview is then given of future plans for the restoration of juniper rangelands in the province through inclusion of both sedentary and migratory communities.

Phuntsog Tsering from the Ladakh Department of Sheep Husbandry, India, Yeshe Dorje from the Livestock Research Institute, TAAAS, and Tsering Norbu from the Tibetan Academy of Social Sciences gave an overview of pashmina production systems research conducted in the Chang Tang of eastern Ladakh and western Tibet. General trends are documented in each region and then comparisons are drawn across the border. In both regions, conservation remains a key policy focus and pastoralists struggle to adapt to new protectionist policies and development practices, which often prove to be government mandates that are at odds with each other.

A film by Sanjay Barnela and Vasant Sabarwal of Moving Images illustrated the lifestyle of the Gaddi herders of Himachal Pradesh, India and the recent socioeconomic forces that are negatively influencing their livelihoods. Extensive interviews with herders, government officials, and academics reveal various

perspectives regarding pasture health and allegations of over-grazing. The film highlights the conflicts that arise when pre-existing customary rights are ignored in the formulation of land use policies, and the social and ecological consequences when local community voices are ignored.

Yildiz Aumeeruddy-Thomas presented highlights of research from a WWF People and Plants initiative in Dolpa, Nepal regarding medicinal plants and their use and conservation status. She first presents an overview of the cultural significance of medicinal plants in the local medicinal system and then describes the relationship between grazing practices and medicinal plant use and extraction in the high pastures of Pungmo village. She argues that medicinal plant management should be incorporated into existing customary institutional systems that regulate grazing, which are viewed as effective mechanisms for control.

Finally the paper by Tony Banks describes *de facto* tenurial arrangements for the management of pastures and their potential as a basis for improved rangeland management in the rangelands of the Altai mountains in Xinjiang, China. He argues that these common property institutional arrangements are effective at minimising exclusion costs, realising economies of scale with respect to herd supervision, providing social insurance via equal access rules, and helping to abate environmental risk.

Agropastoralism In the Northern Areas of Pakistan – A Systems Approach to Research

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Background

The mountainous Northern Areas of Pakistan lies at the junction of the Karakoram, Western Himalayan, and Hindu Kush mountain ranges. The Western Himalayas create a rain-shadow over the region, shielding it from monsoon rains and leading to its semi-arid condition. Typical annual precipitation in the valley floors is 150 mm; temperatures can drop well below freezing in winter, while in summer, heat trapped in the barren valleys can send temperatures above 40°C.

The region has undergone rapid development during the last 20 years due to two main factors: construction of the Karakoram Highway, leading to dramatic improvement in the communication infrastructure and a new network of 'jeepable' roads throughout the region; and the activities of the Aga Khan Development Network and other agencies. The Aga Khan Rural Support Programme (AKRSP) has become increasingly interested in the indirect effects of these changes.

The agro-pastoral system found in the Northern Areas entails subsistence arable cropping, fruit production, livestock production, and to an increasing extent, cash-

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cropping. Livestock are kept by the vast majority of households and are an important component of the local economy; they are managed according to a system of transhumance. Animals are kept in villages in winter and subsist on a diet of cereal crop residues and alfalfa; they are moved to high pasture areas in summer. The region's livestock production system involves conversion of inputs – mostly feed, in the form of forage or fodder, and labour – to outputs – milk, butter, meat, draught, transport, fibre, dung, income, and tradition. Of the several existing constraints to improving livestock productivity in the region, the largest is shortage of winter fodder. Mature cow body condition scores plummet between the months of October and March and increase steadily until October of the next year. Another issue is that there is less labour available for livestock raising than there was in the past, and cash crops are seen as more valuable. Increases in education give children less time to herd livestock in the short term and less of an inclination to continue this way of life in the long term.

The project

The research project was established in 1998 by AKRSP to assess the impact of development change on local livestock enterprise. The project had three components – pasture ecology, livestock production, and socioeconomics. A single study design was used to allow final synthesis. The design included villages from three agro-ecological zones – single, transitional, and double-cropping – and two geographical transects differing in ease of access – the Karakorum Highway (KKH) and Gilgit-Ghizer Region (GGR). Within each of the villages, approximately 20 households were selected for socioeconomic study. Of these six or seven were selected per village for more intensive study under the livestock production component of the project. As the three project components were closely interrelated in the study villages, we adopted a systems approach including the following four steps:

- define the boundaries of the system of interest,
- define the objectives of the system,
- describe the resources,
- describe the components and their interactions.

One of the main activities of the project was village workshops, which were held at the end of the second year. At these workshops, representatives from each study village met for the purpose of giving feedback and comments. Preliminary findings were presented, and suggestions were made for improving the system.

Findings and recommendations

The situation in the dry temperate range type of the two transects is similar; production and utilisation are high only between March and June, and available biomass is relatively high from March to December, leaving only two winter months of low available biomass. In both transects, there is potential for increased spring grazing of this range type. However, production and utilisation in the alpine range type (grazed during summer and critical for recovery of live weight and body condition in preparation for the coming winter) differed between the two transects. The alpine range of the GGR transect had slightly lower production but nearly twice the utilisation of the KKH transect. Thus, summer pastures of the GGR transect are more heavily utilised and are being grazed at closer to their carrying capacity than are those of the KKH transect. Nonetheless, livestock in the GGR transect gain more live weight and body condition during summer than do those in the KKH transect.

Although livestock of the GGR transect gain more during summer, feed available to them during winter was only 0.8 of that required, whereas in the KKH transect, winter feed was 1.2 of the requirement. This relative lack of feed in the GGR transect was reflected in inferior livestock kidding and milking performance.

Other differences were also found between the two transects. Labour input per animal was significantly higher in the GGR transect. Households in the GGR transect depended relatively more upon farming, pensions, and labouring for their incomes; whereas households of the KKH transect (where people tend to be slightly more educated) depended more upon potatoes and private business. Both transects depended upon livestock for about 12% of their income.

Potential ways to increase livestock production in this region include increasing winter fodder availability, improving pasture utilisation, reducing livestock numbers, and improving marketing possibilities.

- Winter fodder availability may be increased through a combination of land development, changes in cropping patterns, introduction of new green crops or increase in cereal crops, and improved feeding systems.
- Pasture utilisation improvements should be conducted by pasture committees and might include earlier movement to dry temperate pastures in spring, and in the KKH transect, increased utilisation of alpine pastures, although the latter is complicated by low labour availability.
- Reduction in livestock numbers would reduce required labour and might increase individual animal productivity. Potential problems with this are centring of risk on fewer animals and impacts on culture and traditional management.
- Improved marketing would increase economic returns to livestock production. This might be accomplished through local or regional markets or through a market monitoring information system.

The next three papers present the detailed findings of the three project components.



Productivity and Use of the Pasture Resources of the Northern Areas of Pakistan

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Background

There are three range types in the semi-arid Northern Areas of Pakistan – foothill, dry temperate, and alpine; these differ in altitudinal range and type of vegetation supported. The foothill range type is usually near villages and is grazed by livestock during winter. These same livestock, managed under a transhumance system, graze the dry temperate range type during spring while moving towards the alpine range type, which is grazed only during summer when it is free of snow. Livestock also use the dry temperate range type during autumn while returning to the villages.

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Pastures in the Northern Areas fall under communal, state, and private ownership. The most common of these is communal, in which pasture resources are owned by a defined group of users and institutional arrangements exist for the use of resources. Ownership of state pastures lies with the Northern Areas government, but villages have grazing rights in those areas. Khunjerab National Park is an example of a state-owned pasture area. In the case of private pastures, individuals develop the pasture area in question for grazing or grass cutting, and hence establish secure claims to future benefits from that pasture.

Each village or cluster of villages has an institutional body for managing pastures, primarily consisting of experienced herders from the village. Such an institutional body uses consensus to make various decisions. These decisions usually relate to one of four main topics: 1) grazing schedules; 2) distribution of pasture to different households, tribes, or clans; 3) grazing fees charged to other villages wishing to use local pasture resources; or 4) penalties imposed on those not following the mutual agreement.

The only comprehensive information available on land use of the Northern Areas is based on the interpretation of 54 Landsat Satellite Thematic Mapper images at a scale of 1:250,000, carried out in 1990-1991 by the Forest Sector Master Plan (ADB and UNDP 1992). The accuracy of this information is doubtful, however, since widespread impossibility of interpretation of images - due to cloud cover and the rugged nature of the terrain - left almost 65% of the total area unclassified.

The present project

This study was conducted as part of the Agri-Karakoram Project, with the broad objective of gaining information about the ecology of mountain pastures that exist in the Northern Areas of Pakistan. The study had two main objectives. The first objective was to classify and characterise the vegetation communities present and their distribution within the study area. The second objective was to measure the biomass, production, and utilisation of the vegetation and identify the key differences in pasture use between the two geographical transects, determining where possible the causes of any differences found.

The extent of pastures varied among study villages. A preliminary survey was conducted at the start of the study to devise criteria for the selection of study pastures, and then an assessment was made of the approximate area per pasture available for livestock utilisation associated with each village. This information was gathered from herd owners and shepherds.

All pastures of the foothill and dry temperate range types were selected as study pastures for study in any given village, as there were relatively few. Sub-pastures within the main pastures were then selected to cover the full range of vegetation types, uses, altitudes, and aspects present within each pasture. In selected sub-pastures, 30m transects were laid randomly across hill contours, and quadrats were placed at 10m intervals along these transects. Quadrat size varied according to range type, with larger quadrats used in alpine range types, and smaller ones used in the dry temperate and foothill range types.

Production, utilisation, and available biomass parameters were measured using a paired cage plot method. In each sub-pasture area, cages were set up at six points.

These were paired with uncaged plots of the same dimensions to allow combined quantification of herbage production and utilisation. Grazing was allowed on the uncaged plots, whereas the caged plots remained ungrazed during each sampling period. Vegetation was clipped to ground level from both caged and uncaged plots simultaneously on all clipping dates, which were designed to cover both the main periods of livestock use and the growing season.

Results and conclusions

Results include data on several topics, including surface material distribution of pastures; information about the three plant communities (alpine, temperate, and foothill); effects of altitude and slope; seasonal variations in production, utilisation, and biomass; and transect variation in production and utilisation. Results show that vegetation ranged from very sparse shrubs in foothill pastures, to more dense shrubs in dry temperate pastures, to forb or grass dominance in alpine pastures. Production, utilisation, and biomass increased with altitude, probably because of increased water availability from snowmelt. Water availability also governs the movement of transhumant livestock under semi-arid conditions.

The two main conclusions of this study relate to use patterns of two different range types. The first conclusion is that mean forage production of dry temperate pastures overall appeared to be higher than utilisation during the spring season. The second is that much heavier use of alpine pastures in one transect raises two questions requiring investigation: 1) Why is the use three times heavier than in other transects?; 2) Despite this heavier use, why does animal condition improve faster in that transect than in others? These conclusions indicate two potential areas for modification of use patterns to gain maximum benefits from the available forage resources.



Availability and Utilisation of Stored Feed Resources and Their Impact on Livestock Production in the Agro-Pastoral System of Northern Highlands of Pakistan

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Background

The Northern Areas of Pakistan has undergone rapid socioeconomic change in the past two decades, partly as a result of the construction of the Karakoram Highway (KKH), which bisects the region into more-developed and less-developed areas. In the present study, two regions were selected – the KKH transect, accessible and developed, and the Gilgit Ghizer Region (GGR) transect, relatively inaccessible and underdeveloped. Within each transect, one village was selected per agro-ecological zone (AEZ). These AEZs included the single cropping zone, with one crop per year; the

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transitional cropping zone, with sometimes one and sometimes two crops per year; and the double cropping zone, with two crops per year. In each village, six or seven households (hh) were selected for study using a stratified random sampling technique. The study reported here was designed to assess the impact of socioeconomic change resulting from improved infrastructure on the livestock enterprise. To this end, nutritional inputs and productive outputs were compared in a series of villages differing in degree of accessibility to the KKH. This study represents the first rigorous, quantitative assessment of seasonal aspects of livestock production in the region.

Project implementation

In October 1999, the volumes of all stored roughage resources within individual households' storage areas were estimated, and roughage mass was calculated using estimates of average density derived from sub-samples of the various roughage types. The approximately 1,100 animals associated with study households were ear-tagged for identification and weighed before feeding, and their body condition scores were taken. Herd metabolic weights were also estimated.

To assess depletion of stored winter feed resources for livestock, the above measurements were taken at each household approximately every 50 days for 12 months. Metabolisable energy (ME) requirements for maintenance of live weight were calculated using AFRC (Agricultural and Food Research Council) guidelines. Sufficiency of ME in early, mid, and late winter was then calculated by dividing estimates of stored ME resources in each household by the estimated total ME requirements of each household based on their complement of livestock. Data on reproductive performance was collected by interviewing farmers about which animals had given birth on which dates. Milk production of all lactating cattle was measured for one full day each week by a trained member of each study household, as well as once by the author during each village visit.

Results and discussion

The study results provide detailed quantitative information on various aspects of livestock enterprise in the Northern Areas of Pakistan, including herd composition and weight, livestock trading, stored feed resources, patterns of feed utilisation, and livestock productivity and reproductive rate.

Inventories of herd composition indicated that cattle are the dominant livestock species within this mixed mountain agriculture system, and domestic milk production is the primary purpose for which livestock are kept. Cattle were more abundant on a household basis in the GGR transect, perhaps reflecting a greater demand for milk and butter by these comparatively large households.

There is evidence that animals in the GGR transect were fed lower-quality feed during winter. Body condition score was higher at the start of winter in the GGR transect than in the KKH transect, but GGR animals lost condition more rapidly as the winter progressed. Animals in this transect also produced less milk than those in the KKH transect and exhibited lower reproductive performance.

Despite the poorer road infrastructure in the GGR transect, trading of livestock and fodder was more prominent there than in the KKH transect, reflecting the greater

economic reliance placed on livestock in this transect, where opportunities for other sources of income are limited. The larger herd sizes in the GGR transect also allowed larger numbers of animals to be traded. Furthermore, lucerne was grown on marginal land on a larger scale in the GGR transect for subsequent sale at market.

This study demonstrated the important nutritional role of summer pasture off-take on renewing livestock condition for the period of winter food scarcity. Furthermore, by recording livestock parameters in transects differing in their degree of development, this study allowed the impact of developmental change on the livestock enterprise to be assessed and future trends to be predicted. Efficiency of various livestock production and reproductive parameters was higher in the KKH transect than in the GGR transect, reflecting the more advanced stage of development found along the KKH. Matching of feed resources with requirements led to greater output per animal. The reasons for the reduced animal numbers in the KKH transect may relate to a decreased need to store capital in livestock due to more awareness of other ways of saving. Decreased availability of labour for livestock tending in both summer and winter may also play a role. Finally, a reduced reliance on livestock as a source of income with increasing prominence of cash crops, such as potatoes, may have diverted effort away from livestock. Livestock are still regarded as an important component of the domestic subsistence economy in both transects. If livestock are to become a means of generating cash income, then issues of livestock product marketing and competition from external sources must be addressed.

Human and Economic Issues Associated with Livestock Production in the Northern Areas of Pakistan

Jürgen Clemens¹

Background

Livestock are an important component of rural livelihood strategies in the mountainous Northern Areas of Pakistan, where animal husbandry has traditionally been integrated into mixed crop-livestock systems also including irrigated farming and forest and rangeland utilisation. However, farm economies in this region are changing due to improved transportation facilities, education, access to markets, male off-farm employment, and activities of government programmes and non-government organisations.

Agro-pastoral management systems in the Northern Areas usually cover huge vertical ranges, from irrigated valley bottoms to montane and alpine rangelands, the latter used as common property resources. High-altitude summer pastures are frequently not used to their full potential. However, farms in the irrigated belt in the lower valleys are generally too small for self-sufficiency, so the land available for growing winter fodder is limited. Therefore, the main constraint to livestock productivity is scarcity of winter feed, causing the number of animals in the region to decline significantly during the cold season. Lack of labour for herding livestock is considered the second major constraint. Therefore, utilisation of certain alpine pastures has been reduced,

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and some animals are being stall-fed or grazed year-round near homesteads. Other strategies to decrease labour inputs to summer pastures include reduced herd sizes, joint management systems, and paid external labour.

Farming – especially growing potatoes – is now perceived to be the most important economic activity in the area. Conversely, products of the livestock sub-sector tend to remain within farm households, and this sub-sector appears to be little affected by increased accessibility to markets. In spite of increasing meat and milk demands within the region, only a few livestock owners have so far engaged in regular marketing of animal products. This situation further decreases the proportion of irrigated land committed to growing winter fodder for livestock.

Previous surveys of the total livestock population in the Northern Areas have generally indicated decreasing herd sizes per household – due to off-farm education and employment opportunities – and an increasing total livestock population – due to increases in human population and the fact that a minimum number of animals is required to meet household needs. However, the latter is not generally supported by recent estimates based on existing data on human population and individual livestock holdings.

The present project

This paper, based on a recent study of farm household economics carried out as part of the Agri-Karakoram Project, assesses the current status and trends of the livestock sub-sector in the Northern Areas of Pakistan – especially regarding total livestock population, herd composition, and economic importance of livestock – as well as issues pertaining to agro-pastoral management strategies and marketing potential. The study analyses within a wide socioeconomic framework current and predicted changes in the livestock sub-sector resulting from improved transport infrastructure and subsequent external commodity supplies, as well as better opportunities for education and off-farm employment. The approach consists of several steps, including assessment of existing secondary data, informal and formal surveys in sample villages, and in-depth interviews with experts and resource persons at different levels. Special focus was placed on farmers' own perceptions of the ecological, socioeconomic, and cultural frameworks of animal husbandry; which are important determinants of local management strategies. The goal of this adaptive research was to identify feasible and sustainable management interventions to improve livestock production.

In the six project study sites, farmers' own experiences and perceptions of herd size changes were analysed as an alternative source for assessment of livestock trends in the Northern Areas. Reasons offered by farmers for increases and decreases in livestock holdings show a clear correlation with labour availability. Respondents mainly attributed decreases to the lack of family members to tend animals or to the recent division of their fathers' joint households. Other important reasons for keeping fewer animals were disease; lack of fodder and grazing areas; and sale, slaughter, or natural death of animals.

Suggestions

The analysis of existing livestock data for Northern Pakistan shows both consistent trends and conflicting results, especially regarding overall patterns of the livestock

population. There also remain knowledge gaps with regard to the contribution of animal husbandry to overall farm and household incomes.

Thus far, gaps in human food production in mountain regions of the Northern Areas of Pakistan have been easily overcome by regular purchases of subsidised staple food supplies, such as wheat. Animal feed, however, cannot be obtained in sufficient quantities. Thus, there is a huge need for increases in cropping potential in the region to fulfil both human and animal demands. Successful strategies include the development and irrigation of additional land, as well as changing cropping patterns to increase the net area sown (this can be done through wider introduction of winter cereals, selection of more location-specific cereals and fodder crops, or use of multipurpose trees). However, farming communities have reservations about development interventions. More holistic approaches are needed that place special focus on farmers' perceptions, participation, capacity building, and integration into decision-making processes. This also holds true for sustainable utilisation of rangeland resources. Local communities are the major stakeholders in these natural resources, and their direct integration into the identification of priorities and the implementation of management strategies is a prerequisite for successful development activities. Thus, further recommendations for increasing rural incomes in the Northern Areas of Pakistan must be based on identification of economically and ecologically feasible management interventions and consideration of farmers' own priorities and capabilities.



The Changing Pastoral Systems of Balochistan, Pakistan: Endangered Migration

Abdul Wahid Jasra¹ and Mohamed Afzal²

Background

Balochistan, the largest province of Pakistan, stretches over 34.7 million hectares and comprises 44% of the country. Production potentials of Balochistan rangelands are low at 30-280 kg/ha/year. Under the prevailing harsh climatic conditions, these ranges do not produce enough forage to fulfil the needs of livestock year-round. This necessitates seasonal migration of flocks in search of food and water. Therefore, pastoralism is the main use of natural resources.

Over centuries, pastoralism has passed through various stages in response to the prevailing socioeconomic and environmental conditions. All pastoralists in this region probably originated as nomads. With the passage of time, socio-political advances in their communities combined with other forces (such as extreme weather conditions, water and feed shortages, and security threats) have changed migratory habits. Hence, a process of sedentarisation began among nomadic pastoralists, which led to the segregation of pastoralists into various groups – nomadic, transhumant, and sedentary.

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Nomadic pastoralists in Balochistan do not own land, and thus depend completely on livestock production on freely accessible rangelands. They roam year-round, following specific routes and patterns of migration with their flocks of 200-700 sheep and goats per household. These are primarily Afghan tribes affected by border closures and subject to extreme poverty.

Transhumant pastoralists are seasonally sedentarised. They have specific, seasonal camps in the highlands during summer. At these camps, they undertake rain-fed crop cultivation, from which they may derive up to one-third of their total income. Although their herd sizes, at 60-200 animals, tend to be smaller than those of nomads, their major income source is always animal production.

Sedentary pastoralists are transhumants that have permanently settled and do not practice any type of migration. Sedentary and transhumant flock sizes are comparable. Many of these communities have acquired valley bottom land and engage in horticultural tree cultivation, exploiting valuable groundwater through tube-well irrigation.

These pastoralist communities are currently undergoing remarkable transformations due to various socioeconomic motivations and compulsions. These encourage settlement of pastoralists, migration of landless farmers to urban areas for alternate employment opportunities, and most importantly, the breakdown or weakening of traditional pastoralist decision-making mechanisms that has probably accelerated possibly irreversible degradation of rangelands.

Results

This study investigates and documents the prevailing socioeconomic systems of pastoral communities and their recent trends in highland Balochistan under the influence of the following elements:

- the high rate of increase in human and livestock populations, and the consequent degradation of rangelands;
- government policies that have consistently encouraged underground water mining for value-added agriculture, particularly orchards; and
- the Afghan war, which blocked traditional migratory routes and caused an influx of refugees with animals.

Rapid rural appraisal surveys were conducted important components of which were transect walks, observations, gender aspects, mapping, and semi-structured interviews. Various characteristics of each pastoral community were explored to sort the communities into categories. These characteristics included major income and subsistence sources, feed resources for animals, livestock and lifestyle, migration, and social profile. Secondary information was then used to substantiate survey findings.

The results indicate that few traditional migratory or nomadic pastoralists now exist. Many of the remaining nomadic communities have adjusted to the socioeconomic changes and engage in more commercial enterprises, depending on the opportunities presented. Many are Afghan refugees and do not own flocks. Instead, during summer, they establish camps in the urban suburbs with access to good livestock markets. If these opportunists observe a downward trend in the daily market price of sheep, or if

they manoeuvre a good price deal, they buy a few animals, up to 20 at a time. Being a regular visitor of the market, they use their market intelligence to fetch good deals by interacting with those from the rural areas who have poorer knowledge of animal prices.

Many migratory groups, whether transhumant or nomadic, have been forced into low-wage jobs, as a result of extreme drought in the past several years. This has been exacerbated by excessive overgrazing due to high numbers of Afghan refugees moving into the province and the lowering of the groundwater table through tube-well irrigation, reducing the overall productivity of the rangelands.

Actions

In Balochistan, the sustainability of pastoralism, along with conservation of natural resources, must rank as a top priority at various decision-making levels to avoid sudden socioeconomic instability. This requires rehabilitation actions in partnership with all classes of pastoralists. While considering this study as a diagnostic one, the National Aridland Development and Research Institute (NADRI), in collaboration with its provincial partner institutions, has been looking at juniper forests as the entry point where all users of forests and rangelands could effectively be included in conservation and rehabilitation projects. Meanwhile, NADRI, in collaboration with the provincial Forest Department, has established nurseries to produce fourwing saltbush seedlings for large-scale plantations in degraded juniper zones. In the long run, fourwing saltbush would relieve grazing and fuelwood pressure on juniper forests.

In the first phase, over 0.5 million seedlings have been planted, with greater than a 90% success rate. To compliment this on-going rehabilitation programme, the International Centre for Integrated Mountain Development (ICIMOD) is sponsoring another study to identify secondary users and to focus on pilot migratory communities to be involved in future rehabilitation and management actions.



Balancing Pashmina Production and Wildlife Conservation In the Chang Tang of Tibet and Ladakh

Tsering Phuntsog¹, Norbu Tsering², Yeshe Dorje³

Background

The Chang Tang region covers a vast area of the Tibetan plateau, spanning 1,200 km in the Tibet Autonomous Region (TAR), China, and Ladakh, India. With an average elevation of 4,000-5,000 masl and an annual precipitation of less than 100 mm, it is one of the harshest inhabited places on Earth. Much of the region offers vital habitat for globally important wildlife species, such as blue sheep (*Pseudois nayaur*), Tibetan gazelle (*Procarpa picticaudata*), Tibetan argali (*Ovis ammon*), 'kiang' or Asiatic wild ass (*Equus kiang*), Tibetan antelope (*Pantholops hodgsoni*), black-necked crane (*Grus nigricollis*), wild yak (*Bos grunniens*), and snow leopard (*Panthera uncia*). Two of these

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species are endangered – snow leopard, prized for its pelt, and Tibetan antelope, rapidly being hunted to extinction for its fine underbelly hair. The Chang Tang is also home to the Changpa, some of the last truly nomadic people, who have increasingly found themselves at the fringes of modern development in a rapidly changing world.

In order to survive this areas' cold and harsh environment, herders have been rearing livestock here for thousands of years and have created a rich and unique pastoral culture. Although sheep and yak are important for producing the necessities of life in the Chang Tang, pashmina (cashmere) is the major source of monetary income. The Chang Tang provides ideal ecological conditions for fibre production, and thus produces some of the finest-quality pashmina and sheep wool in the world. The study areas in both Tibet and Ladakh have been well known for their high-quality pashmina goats for centuries, fetching increasingly higher, although volatile, prices in international markets.

Traditionally, Tibetan pashmina was traded or sold to Kashmir, India. However, in the 1960s conflict with India closed the border, and the Chinese government developed a monopoly on purchasing pashmina. An advantage of this is that the government is better able to control pashmina prices. However, more savvy local traders would prefer the option of trading on the open market, in order to capitalise on higher prices when they occur. Over the last three decades, pashmina production has increased, and the government has implemented programmes to improve breeding and winter forage availability, but these have met with limited success.

On the Ladakh side, pashmina is still sold primarily to Kashmir, although supplies are also taken across the border to Tibetan markets when prices are more favourable there. Local Changpas often find themselves at the mercy of Kashmiri middlemen, who exploit local herders by offering lower than market prices for their pashmina, or they trade for staples.

A severe shortage of winter pasture resulted from the border closure, exacerbated by an influx of Tibetan refugees and their herds. Thus the Changpas of Ladakh have become increasingly dependent on Indian government subsidies to supply them with feed, fodder, and veterinary services. Development interventions in this region have been largely unsuccessful due to their top-down nature and lack of understanding of the local socioeconomic realities and lack of political will to address the monopoly on pashmina held by Kashmiri traders.

Given its economic importance in the international fibre arena, and the conservation significance of the region where such fibre is produced, ICIMOD helped to support transboundary research regarding pashmina production and the ecological status of the rangelands upon which these animals depend. Both regions have great potential to develop, improve, and expand their pashmina production for the economic benefit of the local people, but this must be balanced with conservation initiatives. This poses challenges for the development of pashmina in these regions, although efforts are beginning to address this perceived conflict.

Results

Table 1 summarises and compares the major issues and findings across the two study areas. In general, both areas have experienced similar trends with regard to

pashmina production and conservation. However, important differences exist regarding infrastructure development, marketing, and access to social services, which are highlighted below.

Table 1: Major issues and characteristics of the two Chang Tang study areas in Rutok County, Tibet and Nyoma Administrative Block, Ladakh

Tibet – Rutok County	Ladakh – Nyoma Block
Government controls pricing of pashmina	Pashmina pricing controlled by traders
Education poor	Mobile schools and centralised boarding schools top priority to establish in near future
Transportation limited – poor road network	Good network of roads (except two villages)
Poor access to international markets for pashmina (controlled by government)	Poor access to domestic pashmina market
Exploitation by some traders but minimised by competition with government pricing	Stronger exploitation issue in Ladakh – no government pricing scheme
People lose subsidy for snow disasters if they sell privately (pay 10% tax and lose subsidies for improvements)	No penalty for private selling (of pashmina) – government gives subsidies regardless of markets
Health care major issue	Health care being addressed by Ladakh government
Livestock-wildlife conflicts problem	Livestock-wildlife conflicts problem
Changing socioeconomic patterns – more goats, increasing settlement	Changes in lifestyle – desire for settlement in some areas
Influx of Hui Muslims (with livestock and trading)	Influx of Tibetan refugees and their livestock
Wildlife conservation focus by government	Wildlife conservation focus by government
Winter pasture shortage – poor intervention by government	Winter pasture shortage – limited intervention by government
Conservation housed in Animal Husbandry Bureau – more closely linked with primary livelihood	Conservation housed in Department of Forestry – poor integration with Sheep Husbandry Department
Pasture management mandated to Animal Husbandry Bureau	Pasture development mandated to Department of Forestry – do not know what to do
Water management big issue	Water management big issue
Hunting of animals by Chinese Army, government officials	Army now involved in hunting control
Chinese Army not engaged in public works	Indian Army more involved in community development
Historical impacts of Cultural Revolution – low-lying areas converted to agriculture, loss of <i>Myricaria</i> shrublands	No major conversion to agriculture in low valleys (beyond traditional farming areas)
No feedbanks – focus placed on fencing and reserve pastures	Feedbanks established – concentrates transported from the Punjab
Yak dung used for fuel – impact on wood not known – need to identify trends	Now have cooking fuel throughout the Chang Tang
Solar lighting in almost all households	Solar lighting in almost all households
Some full ‘settlements’ established	Trying to provide new tents, no infrastructure for settlement
Low potential for eco-tourism due to restricted status of area	High potential for eco-tourism
‘Amchi’ (traditional healer) medicine still used but not supported by government – needs follow-up	Amchi medicine used and promoted
Top-down decision making at the county level	Supportive government structure for participatory development (Autonomous Hill Development Council)

Actions taken

Ladakh

During this project, it became apparent that several issues needed immediate attention. Among them are improving the nutritional status of the Changpa people and changing the migratory system to benefit children and the aged. There is also a need for pasture improvement and increases in available land and water resources. The top-down policy followed by the government in implementation of programmes to benefit the Changpas has proved ineffective in alleviating or mitigating herders' concerns. Therefore, planning at the grass-roots level is now being encouraged by the Ladakh Autonomous Hill Council.

Various stakeholders have taken the initiative to address issues identified during this study.

- The Ladakh Autonomous Hill Council has called meetings among stakeholder groups to identify research and development gaps and to promote better coordination among organisations, promoting a conservation ethic for the Chang Tang region.
- Plans have been proposed for improved boarding schools and mobile medical clinics.
- The Sheep Husbandry Department has initiated forage development in the Chang Tang area, using participatory planning methods from training programmes.
- infrastructure is still tremendously impaired, although much improved recently seen through government programmes.
- Development of a pashmina cooperative to promote local processing and marketing.

Tibet

Progress has been slower on the Tibet side of the border, mainly due to greater remoteness and lack of local staff to implement participatory planning exercises. However, the following has been achieved as a result of this study.

- Training of Ali Prefecture and Rutok County officials and government staff to build skills and ensure support.
- A small-scale study was conducted at the local level to gauge interest in one township community for an improved breeding scheme.
- The project and research results were publicised through the media, and copies of reports were provided to other organisations.

Pastoral Politics (Summary of Film)

Sanjay Barnela¹ and Vasant Saberwal¹

Background – the Gaddi and their lifestyle

Gaddi pastoralists have been herding goat and sheep in Himachal Pradesh, northern India, for many centuries. They migrate over distances in excess of 300 km between the alpine meadows of the high Himalaya in summer and the forests of the Siwaliks and lower Himalayan ranges in winter. There are currently approximately 100,000 Gaddi, and they earn their livelihoods through a combination of cultivation and herding.

Most disputes among the Gaddi are settled internally, without need of interference from outside. For example, if an animal from one herd strays into another herd (a common occurrence on the unfenced grasslands), the owner simply looks through the other herd, sorts out his animal, and takes it back to his own herd. This is facilitated by the unique earmarks put on each Gaddi herder's livestock and by the mutual trust among herders.

The sheep are sheared thrice a year. As payment, one sixteenth of the wool goes to the shearers. Owners also keep some wool for blankets, coats, and dresses, and the balance is sold. Wool is the single largest contributor to the Gaddis' income.

These herders begin their migration to summer pastures in May and make the return trip to winter pastures in October; they often move slowly, sometimes stopping for up to a month at various locations en route. On the way, they graze their animals along roadsides and in streambeds, as well as on Forest Department lands, village common lands, and pre-harvested privately owned grasslands. They are allowed to graze village commons and grasslands free of charge, and in return they pen their livestock at night on fallow fields belonging to villagers, providing them with valuable fertiliser. This custom of cooperation has existed for well over a century.

In both the summer and the winter pastures, the Gaddi have grazing rights to clearly defined grazing areas, and so each herder returns to the same grazing runs year after year. Nonetheless, obtaining sufficient winter forage is often problematic. This is due to a variety of factors. First, the expansion of cultivation into common pastures and forests has reduced the extent of the grazing grounds. Second, the Forest Department has closed a large number of forests to grazing on the grounds that Gaddi grazing is responsible for large-scale degradation. Third, there is a profusion of weeds, in particular *Lantana camara*, over much of the land grazed by the Gaddi in winter, again leading to an overall reduction in available forage.

Problem

The Forest Department is interested in raising Himachal Pradesh's forest cover to a minimum of 50%. This is seen as necessary for the purposes of improved water and soil conservation. Gaddi grazing is presumed to reduce forest regeneration, and is thus restricted on some lands. However, many people feel that there is a problem with the assumption that it is only tree cover that is capable of providing these environmental services. It is commonly accepted that vegetation such as grasses and shrubs are also capable of protecting the soil and conserving water, as long as there is adequate overall vegetation cover. Given such a position, the question that needs to

¹ Moving Images, New Delhi, India

be asked is not whether Gaddi grazing is leading to a reduction in forest cover; rather it is whether Gaddi grazing is leading to reduced vegetation cover (grasses and shrubs), and whether this reduction in vegetation is of a magnitude that will have a negative impact on soil and water conservation in the hills.

While there is little data to demonstrate a link between Gaddi grazing and vegetation cover in Himachal Pradesh, the winter forest areas, summer alpine pastures, and privately owned lands that the Gaddi graze all have abundant vegetation. Whether or not this is adequate to conserve soil and water resources remains to be seen.

Importantly, however, there are no data to support the other view – that Gaddi grazing is responsible for negatively altering the water and soil regime. In the absence of such data, the Forest Department's hostility to Gaddi grazing, prevalent for well over a hundred years, is something of a mystery. A variety of historians have suggested that this antagonism of the Forest Department has more to do with a dislike of their nomadic lifestyle than with concern for forest regeneration.

This feeling of the Forest Department, and many other people in India, that nomads are primitive and should be brought into the mainstream of society, has affected many young Gaddi herders, who now want to move into towns and take up other occupations. Other herders do not see a problem in continuing with their traditional occupation, and seek to continue herding. However, the seeds of division within the community are sown, and it remains to be seen how the Gaddi will respond over the next few decades.

Conclusions

The Gaddi have unsurpassed knowledge of the vegetation, seasons, and altitudinal zones in their area, and this has enabled them to carve out an ecological and economic niche for themselves within an intensely used landscape. Gaddi land use occurs alongside numerous farming communities, resulting in biomass production far greater than either the cultivation or herding systems are capable of generating on their own. By stymieing rather than encouraging traditional herding practices, the knowledge that allows such resource use is being lost. Simultaneously, a self-sufficient, highly distinctive, and trained community is beginning to move out of a traditional lifestyle but finds few opportunities in a highly competitive job market.

The Gaddi may choose to quit herding and begin alternative lifestyles, but they should make that choice willingly, not be forced into it by policies and an environment that are unsupportive of their current lifestyle. However, support is not likely to be forthcoming, if the Himachal Pradesh Forest Department is required to meet a target of 50% forest cover over the coming years. Can policies of the Forest Department be reformulated to be more inclusive of traditional forest users such as the Gaddi? Are we willing to conduct research to examine whether or not the Gaddi degrade the lands they graze, or will we continue to assume that irrational, primitive herding practices must make way for the dictates of scientific forestry? Will we assume that a marginal community must make way for the 'betterment of the nation' and that, in this age of fast-paced technology, we have nothing to learn from a traditional community that has been managing these lands far longer than the scientific foresters who call for their displacement?



Medicinal Plants within the Context of Pastoral Life in the Village of Pungmo, Dolpo, Nepal

Yildiz Aumeeruddy-Thomas¹, Yeshe Choden Lama², and Suresh K. Ghimire³

Background

Dolpo is a cultural area inhabited by the Dolpo-pa in what is today the administrative district of Dolpa, bordering the Tibet Autonomous Region (TAR) to the north, Mustang district to the east, and Jumla and Mugu districts to the west. Part of Dolpo has been incorporated into Shey Phoksundo National Park (SPNP), established in 1984 to conserve the unique trans-Himalayan ecology and biodiversity. The largest national park in Nepal, SPNP covers an area of 3,555 sq.km and is inhabited by about 3,000 people, whose livelihoods have been affected by the establishment of the Park. Political upheaval in TAR and the subsequent closure of the Tibetan border in 1959 also had major effects upon local economies and livelihoods in Dolpo, where the Dolpo-pa had had traditional rights to graze their cattle in Chang Tang, TAR. Since then, the Dolpo-pa have instead grazed their herds in pastures located in lower Dolpo or in the neighbouring districts of Jumla and Mugu.

Pastoralism in Dolpo dates back 1,000 years. Indeed, Dolpo is known to have been colonised in the seventh and eighth centuries by people from the ancient kingdom of Zhangzhung, located in western TAR. Studies conducted on pastoralism in Dolpo all confirm that the economy of the local agro-pastoralists is an intricate management system and way of life including integrated agriculture, pastoralism, and trans-Himalayan trade and based on the social dynamic of a communal regulatory system.

Pungmo is one of the major settlements of Phoksundo Village Development Committee, located in the upper part of lower Dolpo. Pungmo has 30 households and 159 inhabitants. There are two customary pasture areas of Pungmo village, Gunasa to the northwest and Pungphu to the north. Although not formally owned, these pastures are surrounded by landmarks recognised by all inhabitants of Pungmo and neighbouring villages. Medicinal plants in these pastures are mainly collected for health care, rather than trade. Culturally Tibetan, the Pungmo community depends upon subsistence agriculture, seasonal trade, and animal husbandry for their livelihood, with yak and yak-cattle crossbreeds ('dzo') constituting the main types of livestock.

The present project

Medicinal plants in Dolpo are crucial for both human and animal health. Since 1997, the WWF-Nepal People and Plants project has developed a systematic study of the medicinal plants of Dolpo, their roles in the local health system, and the status of the amchi (traditional healer) profession; aiming at supporting the conservation of medicinal plants in Dolpo and improving public health. The case study developed in this paper is the result of investigations by various researchers working within this programme during the last five years. It examines the interaction between medicinal plant use and pastoralism in the Dolpo region through a detailed example of pastures

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in Pungmo village, located inside SPNP. It focuses on how medicinal plant management is integrated into the overall life of a high pasture area.

This paper uses oral history to explore Gunasa pasture and the origins of Pungmo village. The relationship of this community with its high pasture areas is described by analysing local landscape names and geographical and religious landmarks. Particularly, we show how pastoral activities are intricately linked to cultural and religious worldviews, as well as to rituals and pilgrimage ceremonies. Pasture management is discussed in the context of the two customary institutions responsible for managing resources in Pungmo, the 'Yulgigothe' and the 'Dratsang'. Present rotational pasture management systems relating to overgrazing issues, including internal control systems, are also described. Finally, we discuss local knowledge related to the overall distribution and diversity of medicinal plants in Gunasa. Based on work during the last four years on medicinal plant management in Gunasa and a scheme developed by the WWF-Nepal People and Plants project in Dolpa, we discuss perspectives for medicinal plant management in relation to pastoralism.

Conclusions

The very large pasture areas available, along with a sophisticated rotational system, seem to have thus far ensured the maintenance in Gunasa of high-quality rangelands with diverse medicinal plants. However, after researching these species, it is clear that each species of medicinal plant reacts differently to different grazing pressures. For example, many species are perennial herbs, whose underground parts regenerate even though the upper part may have been grazed. Moreover, some species may be grazed less than others because of toxic chemical components or specific morphological characteristics, such as spiny leaves or twigs, which deter animals. The resistance of these medicinal plants to grazing may depend on the period during which they are grazed or trampled. No studies exist to date that have analysed in detail the reactions of particular medicinal plants to different grazing pressures and timings. In Gunasa, according to the amchis, no major species has yet been greatly decreased, although species such as *Nardostachys grandiflora* are found in the largest quantities in the most remote areas.

This paper attempts to place medicinal plant management in the overall context of pastoral life, seen here as a social unit. It stresses the need to fit any new management system into local social and cultural dynamics and to try to articulate these new management systems into the larger context – in this case, the overall management system of SPNP, for which two models are proposed. The Park, with its low number of guards and lack of precise knowledge about medicinal plants, cannot protect these species without a close association with the local people. This work also attempted to highlight the importance of man-environment relationships in this high pasture area, as well as in many other areas in Dolpo and throughout the Himalayas. Such landscapes can be interpreted as cultural landscapes, carved over time during the very long process of interaction among societies, livestock, and the environment.



Community-based NRM among Kazakhs In the Tian Shan and Altay Shan Mountains of Xinjiang

Tony Banks¹

Background

Most of Xinjiang's fertile rangelands, and the majority of its 1.2 million mobile pastoralists, are found within Yili Kazakh Autonomous Super-prefecture. Starting in Yili Valley in the central Tian Shan mountains, the super-prefecture stretches north along the Kazakhstan border to the Altay mountains of northern Xinjiang. Virtually all of the rangelands in the region are utilised on a seasonal basis and are considered winter, spring/autumn, or summer range. Although some 80% of pastoral households in Xinjiang have been officially 'settled', settlement has not changed the essential seasonal migratory patterns.

In 1984, communes were de-established in Xinjiang, and legal and regulatory frameworks for pastoral tenure have evolved since. Contemporary rangeland policy in Xinjiang emphasises the assignment of rangeland use rights to individual households and the establishment of exclusive rangeland boundaries via fencing. Stocking rates for individual household pastures are to be derived, monitored, and enforced by Grassland Supervision Stations, run by the Animal Husbandry Bureau.

There are, however, exceptions to the rule of individual household use rights. One of the key characteristics of contemporary pastoral tenure in Xinjiang is the persistence of group tenure arrangements, which are usually established on a kinship basis. The origin of these pastoral groups dates back to 1985, when commune rangelands were initially distributed to small groups of households, rather than to individual households.

A second key feature of pastoral tenure is the presence of fuzzy boundaries. There has been virtually no fencing of rangeland boundaries in Xinjiang. Instead, monitoring and enforcement of boundaries is undertaken through direct observations and actions by community members in the field.

Although rangeland policy prescribes to Grassland Supervision Stations the tasks of calculating and enforcing stocking rates for household pastures, these tasks remain incomplete. In Yili Prefecture, for example, stocking rates for household pastures have yet to be calculated. In Altay Prefecture, stocking rates have been ascertained and are specified in households' grassland use contracts but are not monitored or enforced.

Results

The focus of this paper, based on extensive fieldwork in Yili Kazakh Autonomous Super-prefecture, is on the institutional arrangements governing rangeland use, with a particular focus on pastoral arrangements. This paper first describes the *de facto* institutional arrangements found in the field, drawing extensively from pastoralists' own explanations for these arrangements. It then attempts to explain these arrangements in terms of the social and economic benefits they generate for pastoralists and to briefly evaluate deficiencies in these arrangements from a resource management perspective.

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During discussions with pastoralists, the following four social and economic objectives underpinning contemporary pastoral tenure were identified: 1) minimisation of exclusion costs; 2) realisation of economies of scale with respect to herd supervision; 3) provision of social insurance via equal access rules; and 4) abatement of environmental risk.

- 1) Exclusion activities at the village and group pasture level are subject to economies of scale, and collective ownership of pasture facilitates the capturing of these economies. Exclusion from village pastures during seasons of non-use is achieved by the collective placing of 'grassland protector' households in different seasonal pastures year-round.
- 2) Because pastoral households graze different types of livestock in different pastures at the same time of year; and simultaneously cut hay, cultivate crops, and herd livestock in pastures over one hundred kilometres distant; spatial demands for labour are high. These households must thus economise their labour expenditures.
- 3) Two main characteristics of pastoral tenure in the case study region help guarantee households access to pastoral resources. First, the area of pasture to which the household is entitled remains based on the households' population and labour force in 1985, despite the polarisation of household herd sizes (and wealth) since decollectivisation. Second, access is facilitated by group tenure arrangements, which guarantee member households (and their offspring) access to all group pasture.
- 4) There is considerable climatic variability in the Yili Kazakh Autonomous Super-prefecture, and extreme climatic events, such as prolonged droughts or severe snowstorms, periodically occur. This induces a relatively high degree of variation in the spatial and temporal distribution of accessible forage in the region, and thus exposes pastoralists to a significant degree of environmental risk. The pastoral tenure system must thus help to facilitate the abatement of this risk.

Recommendations

Win-win institutional change, both preserving the benefits associated with existing institutional arrangements and remedying their deficiencies, should be the intermediate goal of rangeland policy. The household ranch model is incompatible with this goal in the context of contemporary Yili Kazakh Autonomous Super-prefecture. Given the absence of alternative proven models, what is required is a learning-oriented, experimental, and participatory approach to institutional change. The practical implication is that more pilot projects are needed that address pastoral tenure and natural resource management issues. The strengthening of existing group tenure arrangements constitutes one potentially promising pathway to institutional improvement.

3 Integrated Development Approaches: Improving Access to Rangeland Technologies, Markets, Alternative In- comes, and Financial and Social Services

9-1

四川草地生态保护和建设模式



3 Integrated Development Approaches: Improving Access to Rangeland Technologies, Markets, Alternative Incomes, and Financial & Social Services

In this chapter, we provide summaries of eight oral presentations at the Lhasa workshop that revolved around various aspects of integrated development approaches, keeping in mind the interconnectivity between technologies, markets, financial capital, and access to social services.

Ze Bai from the Sichuan Provincial Grassland Institute presented the Sichuan Provincial Government's overall strategy for improving livestock production and livelihoods for the Tibetan plateau region of Sichuan. This includes the integration of development initiatives with ecosystem protection, vital to the sustainable development of the Tibetan plateau rangelands.

John Chesworth gave highlights of the Tibet PANAM project in Shigatse Prefecture of southern TAR. He focused on their proposed strategy for livestock improvement and marketing, including upgrading of livestock and access to global markets.

Sabine Meihe from Marburg University in Germany presented the results of their juniper restoration and outreach project, which included a field trip to observe outcomes and talk with local managers of the project. Juniper restoration has great potential, especially if combined with protection from grazing and community involvement in its management.

Chen Yuxiang from the Livestock Research Institute of TAAAS presented the outcomes of forage development trials in two different ecozones of TAR, the riverside agricultural zone of Lhasa valley (3600m elevation) and the purely pastoral high elevation zone of northern Tibet (4500m). They tested over 170 native and exotic species and identified a selection of annual and perennial grasses that have potential for future seed development, which remains the primary challenge for future development efforts.

Ethan Goldings presented the successes and challenges of Trace Foundation's efforts to develop and promote European style cheese made of yak milk. He argued that value addition of niche products from the plateau is the best and most culturally respectful means to improve cash income of local herders, rather than putting them in direct competition with lowland producers who are much more efficient at producing more conventional dairy and meat products.

Nandita Jain from the Mountain Institute (TMI) presented their work in community based-ecotourism in agro-pastoral regions of Ladakh and Sikkim, India. She emphasised the importance of developing alternative conservation models to enhance

livelihoods of communities who live and work around and within protected areas. She concluded that eco-tourism has great potential in these regions but only if viewed as supplementary to agricultural and livestock production.

Nyima Adack and Robert Campbell's paper presents the outcomes of more than five years of development work by the Tibet Poverty Alleviation Fund in Lhoka and Naqu Prefectures of TAR. They have had good success promoting micro-finance schemes, especially an innovative approach for community-based loans to nomad groups in Naqu. A future goal is to link micro-finance loan arrangements to rangeland rehabilitation as a means to improve community involvement in rangeland conservation.

Amchi Tenzing Bista and Yeshi Lama presented a paper discussing the valuable role that traditional Tibetan doctors (amchis) play in remote mountain communities, providing human and veterinary health services to those households who cannot afford more modern medicine. They then describe the formation of the Amchi Association, dedicated to training and promoting Tibetan amchis across the Himalayan range.



Ecosystem Protection and Sustainable Development Strategies for Sichuan Grassland

Ze Bai¹

Background

Sustainable development is an effective approach worldwide to environment and development problems. In China, sustainable development is a basic socioeconomic strategy on the agenda for the 21st century. Grassland ecosystem protection is currently one of the most important components of the sustainable development of regional economies in western China, and has attracted the interest of both central government and international society. Grassland ecosystems play important roles in natural resources and economic development. Thus, grassland ecosystem protection is a prerequisite for the sustainable development of regional economies and should be considered by development projects aiming at poverty alleviation and livelihood improvement.

The total grassland area of Sichuan Province is 20.4 million hectares. Occupying 42% of the province, grasslands are Sichuan's largest ecosystem – four times the size of the cultivated area and 1.5 times the size of the forested area. The Sichuan grassland (part of the Qinghai-Tibet Plateau) is one of the ten most biologically diverse areas in the world and is also characterised by ecological and cultural diversity. Sichuan grassland is one of the five largest pastoral areas in China. Of these five areas, the number of animals kept on the Sichuan grassland is the third largest, the output of major animal products is the second highest, and the output per unit

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area is the highest. Thus, this grassland is an important source of ruminant animal husbandry for Sichuan Province. The number of domestic ruminants on the Sichuan grassland is 55%, and milk output is 90%, of the total for the province. The Sichuan grassland is also an important source of water and wetland resources. Six tributaries of the upper reaches of the Yangtze River rise in the Sichuan grasslands, from which comes 24% of the water in the Three Gorges dam project. The upper reaches of the Yellow River are also located on 16,000 sq.km of Sichuan grassland.

Achievements and problems in grassland protection and improvement

The aim of this project was to use advanced technology, ecological balance, and economic efficiency to develop a superior model of the pastoral family farm. Our activities have provided an effective management model for grassland ecosystem protection, regional economic structural modification, and development of the individual herder family. Our achievements in the field include establishment of seed production, selection, and breeding bases; improvement of grassland management; and vegetation reclamation. We have established seed production units for important forage species such as *Lolium multiflorum*, *Elymus sibiricus*, *Trifolium pratense*, *Vicia villosa*, *Festuca arundinacea*, and *Medicago sativa*. We have also constructed new family farms and pastoral villages at demonstration sites.

Currently, of the total area of improved pasture in Sichuan (957,000 ha), 172,200 ha is cultivated pasture seeded with introduced grasses, and 475,600 ha is fenced pasture. Rodents and insects have been controlled on 4.1 million ha; 6.85 million kg of grass seed is produced per year on 10,800 ha; and pasture has replaced agricultural land on 63,850 ha. Nomads' level of responsibility has been increased with grassland leases, and better facilities have been developed for people, grassland, and livestock. Some 11.5 million ha of grassland (82% of utilisable grassland) has been contracted; 70,000 contracts have been signed; and 66,700 herder families (81% of families in the area) have developed the required "Three Matches" (a house, a barn, and fenced pasture for each family). On these family farms, houses covering 5.1 million sq.m have been built (77 sq.m per family), along with animal shelters covering 11 million sq.m (165 sq.m per family). In addition, 250,000 ha of fenced pasture (3.75 ha per family) and 27,000 ha of forage production area have been developed.

However, there have also been problems. About 10 million ha of Sichuan grassland (72% of the grassland) has become deteriorated, sandy and with rodent damage, resulting in worsened economic conditions. This has decreased grassland productivity by about 20% from 4,500 kg/ha in the 1980s to 3,600 kg/ha. Also, heavy soil erosion and ecosystem instability have reduced the local ability to survive natural disasters, and draining of marshland has decreased the preservation and manipulation of water resources. There are also problems with the low economic efficiency and slow development rate of local pastoral livestock production, coupled with high pressure on the grassland ecosystem. The dominant livestock species is the yak, characterised by low productivity and a long production cycle. Also local people usually pay more attention to yak numbers than to individual productivity. The marketing age of yak is very old at four or five years, and milk yield per lactation is 200-500 kg, only 5% of the yield of improved dairy cattle breeds.

Recommendations

Regional economic development must be paired with ecosystem protection. Humans come first, but we must also consider the environment. We must reform and extend traditional animal husbandry and introduce wise use of grassland resources. This includes developing replacement industries and a diverse economy, increasing farmer income and employment rate, and transferring herders to other professions to relieve the pressure on pasture. Great effort should be put into developing pastoral economics under the premises of ecological protection and security. Grassland ecosystem establishment and reclamation should be improved through science and technology. The sustainability and productivity of grassland ecosystem utilisation should be emphasised. Animal husbandry on these grasslands should be comprehensive, productive, and economically efficient and should provide high-quality, popular animal products.

Strategies for sustainable development of the Sichuan grassland include: 1) vegetation reclamation and improvement of grassland productivity in conjunction with ecosystem protection and sustainable development; 2) establishment of an animal production system that increases livestock production; 3) decreases in herder numbers through development of sustainable enterprises to relieve grassland pressure; 4) suitable law enforcement and monitoring systems for grassland resource exploitation; 5) increased awareness of the importance of environmental protection and sustainable development; 6) investment systems for grassland ecosystem protection and construction; and 7) enhanced cooperation in the mid and lower reaches of the Yangtze and Yellow Rivers on a mutually beneficial basis.

Regional improvement of grassland ecosystem protection and sustainable economic development will improve the productivity of grassland ecosystems, increase farmer income, and improve livestock and ecosystem health in remote, minority areas. These strategies will also protect and develop diverse local cultures, unite nationalities, and help modernise local society. They will benefit ecology, economy, and society in a sustainable and coordinated way.



Changing Perspectives In Livestock Production

John M. Chesworth¹

Background

The county seat of Panam County, TAR, lies in the valley of the Nian Chu River between Gyantse and Shigatse on the Friendship Highway from Lhasa south to Kathmandu. The larger part of Panam lies south of the Nian Chu River and contains several rivers that run north into the Nian Chu. The county consists of 11 townships, of which five at the northerly end receive irrigation water from a dam completed in 1996. The land becomes progressively higher to the south, and the southern townships have little or no agriculture and are principally used for upland grazing.

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Large changes in the region's economy are underway, including signing by the Chinese Government of the World Trade Organization protocol. Changes in infrastructure, such as completion of the railway line from lowland China to Tibet and large-scale upgrading of roads on the Tibetan plateau, will lead to great improvements in the transportation of goods. Together, these changes will lead to an eventual balance between prices for agricultural products and commodity prices. Producers are soon expected to face competition from other areas within and beyond the Tibet Autonomous Region. The seriousness of the challenge faced by producers is exemplified by the fact that some wholesale commodity prices within the county (such as for butter) are more than three times the world price. Producers whose costs are linked to a high value product will find themselves seriously undercut and may be unable to compete with large quantities of foreign goods brought in on new routes and sold at world prices.

Livestock production

Because of the dominance of agro-pastoralism in the northern townships, cattle are more numerous than yaks in the county. Beef, however, is considered a residual by-product, and only old animals are slaughtered. Due to inadequate feed, high calf mortality, and use for several purposes, dairy cattle productivity is extremely low. Sheep carcass qualities are also low, but imported rams have died in the past. There are local markets for pork, chicken, and eggs, but these are not being produced in high quantities.

Poor animal husbandry is acknowledged by both Tibetan and European opinion to be the major problem in livestock production. However, since this project is limited in time and resources, existing veterinary extension workers are being used to reach producers. Panam County has 60 such workers. Of these, two have three-year university degrees, two have two-year college degrees, and the remainder have at least three years of primary education, most having reached primary grade six.

As a result of the very low level of veterinary training, inappropriate treatments are common. For example, a group of veterinary workers revealed that they considered a placenta to be retained if it was not expelled within three hours after birth. Manual removal was then undertaken. Such intervention is likely to pose a significant threat to cattle fertility. Therefore, the main goal of this project is to strengthen the human resources in Panam County, focusing mainly on livestock disease control, rather than productivity. Most efforts are to be concentrated in townships receiving water from the county dam. The results of initiatives in these townships will be felt throughout the county.

There is little understanding in the region of the concept of commercialisation of livestock products. Dairy farming probably represents the most viable commercial output from livestock, but the production cycle is in excess of three years, making illustration of the relationship between input and output difficult. The shortest production cycle is that of broiler poultry, for which there are vigorous markets in Lhasa and Shigatse. As demand for poultry in these centres is currently being met from inner China, regional poultry production may offer a promising commercial opportunity.

Actions to be taken

A series of training courses will be conducted to address the most pressing management issues faced by livestock producers. Also, to provide a glimpse of the potential future competition as China becomes more closely linked to the rest of the world, at least four senior veterinary workers will be sent overseas. This experience will also demonstrate the efficiency possible in livestock production.

Along with an initial batch of 1,000 doses of Jersey semen from within China, the project will provide training in the use of semen in straws, detection of oestrus, and reduction of calf mortality. Feeding regimes and reproductive management techniques for high-yielding cattle will also be introduced.

Discussions are currently being held with villagers about the formation of groups interested in broiler and egg production. Broiler production has been chosen for the initial emphasis due to its lower capital costs and shorter production cycle. Assistance is being given with the purchase of plastic feeders and waterers, as well as netting and timber for the construction of deep-litter pens. Selected farmers will be given compound feeds, so that bird growth comparisons can be made between birds fed traditional poultry feeds and birds given feeds known to be nutritionally adequate. Assistance is planned for egg producers in upcoming years.

The project will assist in the formation of technical associations at several levels, including groups of farmers who can legally obtain credit. Such groups will need to ensure efficient marketing of products in the face of competition from commercial interests based in inner China.

Throughout the county, the forage base is rangeland grazing, augmented by fibrous crop by-products. The feasibility of forage production depends greatly upon the economic viability of alternative land uses. With the present low grain prices in the region, forage production and feeding to commercial livestock offers an attractive use of resources and a potentially high rate of return. Thus, several high-yielding plants are being evaluated, including varieties of beets, cereals, and legumes.



Towards the Green Belt in Southern Xizang – Initial Results of An Applied Research Project to Rehabilitate Degraded Rangelands

Sabine Miehe¹, Georg Miehe¹, and Katja Koch¹

(Background Information for the field trip, the poster is provided as an inset at the end of this chapter)

Background - environmental challenge and potential

The valleys and lower mountain ranges of south-central Tibet Autonomous Region (TAR), China, have a semi-desert appearance. Extremely long-term over-exploitation of the vegetation near Lhasa has caused severe erosion and a change from forest and scrub communities into open steppe. The main ramification for the local human

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population is a marked shortage in wood for construction and fuel. Dung is collected as a substitute for fuelwood, resulting in nutrient deficiency of rangelands and fields. The last remaining juniper shrubs – both the best firewood and a source of incense – are being uprooted in remote areas. In most places, where juniper has already been eradicated, other shrubs are being harvested.

Poplar and willow plantations on valley floors supply part of the rural demand for construction wood, but they offer only low-quality fuelwood and require irrigation or a high water table. Dry, non-irrigable mountain slopes are largely considered unsuitable for tree growth.

Relic trees on inaccessible cliffs or under religious protection suggest that the area might potentially be reforested with juniper. A comprehensive inventory of relic juniper populations – undertaken in 1995-1999 by the Tibet Plateau Institute of Biology (TPIB), Lhasa, and the Faculty of Geography, University of Marburg, Germany – extrapolated potential juniper forest cover in the Lhasa region. Average total annual rainfall, based on measurements along two altitudinal transects above Lhasa, indicates that lower slopes are far from the drought limit of juniper trees (250-300 mm/year), and higher slopes (below the upper tree line at 4,800m) receive precipitation comparable to that in well-known forest areas elsewhere in the TAR.

The project – providing evidence of forest potential

To provide experimental evidence of forest potential, juniper saplings were raised from seed collected from the nearest relic stands, and cypresses were raised from seed resources near their actual western distribution limit in Laangxian. The seedlings were cultivated in an experimental nursery in TPIB for one or two years. In 1999 and 2000, plantation trials were undertaken in fenced experimental plots above Lhasa, at between 3,750 and 4,170m in elevation. Saplings were watered in the nursery and at the time of plantation only, and despite the short cultivation period (compared to the minimum of three years recommended for forestry practices) the survival rate of saplings averaged 18% in the 1999 plantation and almost 100% in the 2000 plantation. Now, after two years of growth, these saplings average 60 cm tall.

This experiment indicates a huge potential for afforestation measures on the eroded, semi-desert landscape of southern TAR that could meet the high demand for wood, help combat erosion on overgrazed slopes, and improve degraded pastures.

The future - combining afforestation with rangeland regeneration

Grazing must be excluded from afforestation plots until trees are strong enough to resist trampling and browsing. This method will also give overgrazed rangelands a chance to regenerate. However, the optimum length of rest period varies with altitude, humidity, soil conditions, and degree of degradation. Successional trends observed in exclosure plots established in Lhasa and Reting suggest that in drier climates and/or areas with lower initial herbaceous vegetation cover, longer rest periods will be beneficial for pasture regeneration.

In more humid areas, where dense secondary *Kobresia* pastures grow within the potential forest belt, herbaceous vegetation will regenerate as well, but the quality and resilience of the pasture might decrease over the long term if left ungrazed. For

example, a plot in Reting at 4,625m was fenced in 1997 and revisited in 2001. It exhibited strong regeneration of herbaceous vegetation towards closed ground cover in several layers. The tiny tough sedge, *Kobresia pygmaea*, which dominates vast alpine yak pastures, was overgrown by herbs and taller grasses. This might have a negative effect on the rangeland ecosystem if grazing is excluded for too long.

From these findings have arisen the following important questions for future interdisciplinary research and action in cooperation with local communities.

- Under which conditions are juniper-wooded rangelands sustainable?
- How long do unirrigated juniper plantations need to be protected from grazing?
- How long is protection from grazing beneficial for different types of rangeland?
- How should medium-term rotations of rangeland utilisation, such as fencing materials and herding practices, be realised in different rural communities?

Improved Forage Trials and Grass Seed Development in the Tibet Autonomous Region

Chen Yuxiang¹

Background

The Tibet Autonomous Region (TAR) has a total of 82 million ha of grassland, of which 66% is useable. There are large gaps in productivity in various prefectures of TAR, however, and the edible forage production of Tibetan plateau grasslands is relatively low, at an average 1.04 ton/ha. The productivity of these grasslands is currently decreasing, resulting in conflicts due to the high requirements of livestock. This has been a constraint to the development of Tibetan animal husbandry, especially in northern TAR, which has frequent natural disasters. Nonetheless, animal husbandry accounts for a large portion of Tibetan income.

The current project

The goal of this four-year project was to introduce high-quality forage seeds, both from inside and outside of China, and to test the ecological characteristics and adaptability of various species on the Tibetan plateau in two different ecozones, the riverside agricultural zone at 3600m and the high altitude pastoral rangelands at 4500m. We then planned to select high-yielding species that appeared well adapted to the unique conditions of the plateau and use them both to improve the natural grasslands and to develop cultivated grasslands in TAR. The long-term aim of the project was to enhance local people's ability to withstand disasters and to be a good example for future grassland development projects in TAR.

Project sites were located at Naqu town (4,500m), Danxiong County (4,200m), Danzi County (3,688m), and Quniba Station (3,780m). The Naqu and Danxiong sites are in the purely pastoral regions of northern TAR, whereas Danzi and Quniba are situated in the Lhasa valley near agricultural areas. Testing was conducted on an area of approximately 33 ha at each site.

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We introduced 157 forage species and 15 lawn species to these sites. Of the forage species, 102 species were from China and 55 were foreign; and 50 were legumes, and 107 were graminoids. Of the lawn species, 3 were from China, and 12 were foreign. Overall, 38 species were annual, 2 were biennial, and 132 were perennial.

Results and conclusions

The phenology of plant growth in the different pastures varied according to elevation. In high-elevation pastures, with low temperatures and short growing seasons, plants only grew for a short period of time and became dormant early in the fall. Thus, they could usually not complete their life cycles. Similarly, winter survival rates were high in the Lhasa valley pasture sites, but in northern TAR – especially at elevations above 4,500m such as in Naqu – survival rates were very low. Most graminoids planted in valley sites were able to produce ripe seeds, as were a few legumes. However, in northern TAR, most grasses were unable to complete their life cycles, and only a few species produced seed.

The table below shows the above ground productivity of six grasses tested at three of the four sites.

Site	Production (tonnes/ha)					
	Canada oat	Brazil oat	Denmark oat 444	Qingyong oat 444	Qingyong oat 473	Tama ryegrass (<i>Lolium multiflorum</i>)
Naqu	39.5	35.3	37.7	—	—	—
Danxiong	59.1	56.6	26.2	55.2	27.8	—
Quniba	40.0	35.3	35.3	18.7	18.7	30.0

Plants grew much faster in the valley than they did in northern TAR. For example, most graminoids in the valley grew at least 100 mm per day. However, at the Dangxiong site in northern TAR, Canada oat grew only 10 mm per day, and in Naqu, Brazil oat grew the fastest at 75 mm per day. Although many of the species were able to grow at the study sites, they were not able to produce seed. For example, at the Danxiong site, all species could tassel, but only Brazil oat and Denmark oat produced seed. At the Naqu site, all species could tassel, but none could produce seed. Ripe seed production of species grown in the Lhasa valley was: Canada oat 1.44 t/ha, Brazil oat 2.03 t/ha, Denmark oat 2.15 t/ha, Qingyong oat 444 1.95 t/ha, Qingyong oat 473 2.40 t/ha, and Tama ryegrass 0.75 t/ha. The above ground productivity of some of the annual oat species was 30-70 t/ha. That of foxtail grass (*Alopecurus pratensis*) and sobia (*Sorghum bicolor*) was 3.88 and 29.8 t/ha respectively.

Based on our criteria of growth rate, nutritional value, seed production, and winter survival rate, we chose 29 species that can be successfully grown in these areas of TAR. We also determined suitable planting and cultivation methods for these species at elevations of 3600-4500m. For example, at the Naqu site, we mixed three grass species (Canada oat, Brazil oat, and Denmark oat) with alkaline grass (*Puccinellia* spp.) and achieved favourable production, although these species did not produce seed. Since these species are capable of producing seed under local conditions, the best way to rapidly and effectively improve local grasslands is to establish a self-sufficient TAR seed production centre, with which we can achieve our goals without relying on outside assistance.



Nomads and Markets: Challenges of Decentralised Production – The Case of Yak Cheese

Ethan Goldings¹

Background

Capturing resources under usually harsh conditions, nomadic communities produce rare and often precious commodities. Until now, they have consumed many of these themselves. Today, some herders seek ways to convert some of their assets into cash, both for security in a vulnerable environment and for luxury use. The rangelands of Eastern Tibet have supported communities of relatively wealthy, but comparatively cash poor, nomads for centuries. Although their access to vast lands and their ample assets on the hoof would make them among the wealthiest rural inhabitants of China, their average per capita annual income is in some cases less than \$100 per person per year, which nationally designates them as poverty stricken. This coupled with the increased frequency and intensity of natural disasters in the past decade such as blizzards and epidemics, has caused some nomad families and communities to question their subsistence production and consumption patterns.

Issue – milk product marketing

In the transition from a largely subsistence to a market economy, mobile animal husbandry brings with it unique liabilities and strengths. For the past five years, Trace Foundation has been working with nomads in Kham on projects to produce an export-quality cheese made from the rich milk of the female yak, the 'dri'. The goals of this ongoing programme are to analyse the production and marketing challenges common to mobile animal husbandry communities and to identify solutions that build on their relative strengths. Below is a discussion of the issue of dri milk product marketing in Eastern Tibet.

The milk of free-range dri has twice the protein, butter fat, and minerals of cows' milk. It is superior in many respects to the antibiotic and hormone-laden milks commercially available throughout the world from grain-fed animals. The main challenge facing these nomads has been to convert the summer surplus of this precious renewable resource into cash. The sparse settlement patterns necessitated by low vegetative production have not encouraged great investment in infrastructure, and thus there is virtually none. Without a developed energy and transportation network, there are few opportunities to bring fresh milk to market.

Butter has long been a commodity in local markets. A dried yoghurt product, which the Tibetans call 'chura', is a version of the similar commodity found throughout Central Asia for at least two millennia. Both chura and butter capture some of the summer milk surplus and are convertible at a relatively low cost.

Under the proper conditions, a rennet-based cheese-making process can produce exceptionally high yields of extraordinary quality. The rare flora and fauna combine with the rarified atmosphere of the high plateau to allow for a curing process that produces a product of amazing subtlety and complexity. This cheese can be stored for up to one year, allowing nomads to transport it to market at a time of their

¹ Trace Foundation, New York, USA

choosing, when prices are favourable. It can provide income from a commodity available in surplus – milk – without decreasing traditional uses of milk as butter and chura. Finally, 100 l of milk (were it possible to transport it to market) would sell for the equivalent of only US\$ 50. Converted to 10 kg of cheese, it sells for US\$ 125 at the producer's convenience, and 4 kg of butter can be produced as a by-product.

The organisational challenge facing nomads in this, as in so many of their endeavours, is to deliver this high-quality, value-added product to an appreciative market, and to ensure that the lion's share of the profits flow to the primary producers. The land can only support a limited economy of scale, and there is a danger of upsetting the delicate ecological balance that has been in place for centuries. Also, many nomads lack language, business, marketing, and other skills and networks to bring this or any other product to market for a fair return. A federation of yak cheese producers might give them some collective bargaining power vis a vis flush middlemen, but this level of cooperation is thus far more a dream than a reality.

Many of the conditions creating the uniqueness of the products of mobile animal husbandry also contribute to the challenges of their successful marketing and distribution, if not their production in the first place. If these challenges can be met in such a way that they enable, rather than constrain or undermine, traditional society and culture, then there is hope that the transition from subsistence economy can be made less painful.

Culturally respectful development

'Nor', means both capital and cattle, and so much more, to Tibetans. They see the yak as a blessing or wish-granting gem ('norbu') that makes life as they know it possible under the often brutal conditions of the Tibetan plateau. Moreover, this remarkable animal helps their culture to flourish. They butcher it reluctantly and sparingly and are loath to cull or sell members of their herd. Herd structure and land-use patterns may appear irrational to outsiders but make clear sense to inhabitants. A culturally respectful development plan begins from this point of departure and seeks to extend or build upon these social axioms. To truly help the beneficiaries, it must also be stable, sustainable, and equitable and mitigate any dislocation it causes.



Ecotourism Opportunities for Pastoralists; Experiences from Ladakh and Sikkim, India

Nandita Jain¹

Background

Pastoralists live in remote areas where extremes are the rule. Their lives are harsh, and they are constantly vulnerable. The unique livelihoods of pastoralists are, however, resilient, and these people are rich in many ways. They live in scenically beautiful areas with amazing natural and cultural heritages.

¹ The Mountain Institute, International Headquarters, Franklin, WV, USA

There are many potential benefits of tourism for pastoralists. Tourism can provide supplemental income and offset losses incurred by traditional economic activities. It can provide opportunities to exchange information and learn about other cultures and livelihoods, and it reduces overall rural-to-urban migration. It is also conducive to the conservation of natural and cultural heritage.

Current project – eco-tourism and home-stays in Ladakh and Sikkim

The mission of The Mountain Institute is to work with local people to meet the unique needs of conservation and equitable development in mountain communities throughout the world.

In May 2001, in Leh, Ladakh, agro-pastoralists, tour operators, non-government organisations, government representatives, teachers, and scientists met together for a workshop. The overall goal was to maintain a balance in the unique cultural, social, and environmental heritage of Ladakh. Specific objectives included conserving the natural and cultural heritage of the area, generating socially and environmentally responsible economic benefits for rural populations, increasing the skill level of eco-tourism service providers, and introducing and influencing policies and schemes benefiting the rural tourism industry.

In Sikkim, surveys were conducted to determine which eco-tourism services local people might consider beneficial. The following is a list of activities that they named:

- Guest house home-stays
- Seasonal wildlife viewing
- Local wildlife guides
- Dissemination of information about the place
- Consumption of local vegetable and dairy products
- Pony operators' union
- Quality, developed campsites
- 'Rebo' (tent) experience
- Grassland management
- Involvement of local youth
- Preservation and conservation of wildlife and habitat

In 2001, a visitor survey, designed by non-government organisations and the private sector and building on previous work in Nepal, was also conducted. There were over 180 respondents, the majority of whom preferred that accommodation be in a traditional village house and that economic benefits flow to the local people. Priority areas for improvement were availability of home-stays, local food, toilets (although most people preferred local ones), and site and wildlife interpretation.

Plans, implementation, and recommendations

As guest house home stays were the most popular option, we focused on that. In 2002, community plans were created, and initial implementation was undertaken. Communities were mobilised around tourism impacts in the National Park. The Khangchendzonga Conservation Committee (KCC) was formed in Yuksam, members of which included farmers, shepherds, pack animal operators, teachers, porters, cooks, and government staff. KCC monitoring activities covered resource use, trails, poaching, and behaviour of visitors and tourism support staff.

We learned several things from the home-stay programmes already existing in Ladakh. For example, the home-stay should reflect traditional styles and ways of life, simple local foods should be served, a minimum capacity of two beds should be available at each home, and the programme should be based on an eco-tourism code of conduct. Training is also required for home-stay owners. This training should cover household management issues, such as cleanliness and cooking and serving of food, and host-guest relations. Guides, pony handlers, and other support service providers require training as well.

We assumed that home-stay owners would be individuals of marginal means and would require basic funds to start their programme. We needed to determine whether or not financial incentives would be required, and if so, why. Potential owners needed to be convinced that this is a beneficial programme, as it will require renovation of their existing homes to accommodate visitors.

Finally, there are several important things to remember when developing an eco-tourism programme with pastoralists.

- Eco-tourism is meant to be a supplementary activity to the existing local economy.
- An incremental, planned, phased approach should be taken.
- Both low-risk and low-investment options should be provided.
- The programme should build on existing assets, including groups and organisations.
- Skills development is required.
- Partnerships are important.
- Finally, don't forget the visitor!!!



Integrated Rural Development in the Tibet Autonomous Region (TAR), China

Nyima Adack¹ and Robert Campbell²

Background

Much of Tibet Poverty Alleviation Fund (TPAF) work takes place in Naqu Prefecture, a pastoral area extending over 20.8 million hectares in north-central Tibet between 4,500 and 4,800m in elevation. Assistance to Naqu began in mid-1998, shortly after the devastating winter of 1997-1998, when snows resulted in a loss of more than one million head of livestock, nearly doubling the number of nomadic people in poverty.

In addition to adverse climatic conditions, long-term degradation of range quality poses a threat to the livelihood and welfare of Naqu's pastoral population. According to the Naqu Prefecture Government, as much as 30% of the rangeland in the prefecture is severely degraded, and degradation processes presently at work are likely to continue unless improved pasture management practices are introduced. Current degradation and desertification processes are believed to be caused by a

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² McKinsey & Company, London, UK

complex combination of factors, including not only global warming and drying of the rangeland, but also social and economic development processes involving settlement of nomadic families in administrative village areas. This settlement, often involving fencing, may be contributing to overgrazing of range areas around winter villages where settlement is taking place.

In response to recent threats to range carrying capacity in Naqu Prefecture, TPAF has launched a number of projects to help determine and demonstrate sustainable range management practices and to improve the quality of nomadic household livelihoods. TPAF's main activities in Naqu Prefecture have included pasture development, village wells, vocational curricula, urban skills training, and micro-finance projects.

Projects

Microfinance in Lhoka and Naqu Prefectures

The main objectives of this micro-finance project were to alleviate poverty in selected sites through integrated social and economic development and to demonstrate to the government the benefits of these approaches, so that they may be replicated in other poverty-stricken areas of TAR. Programmes were to focus on income generation to raise and protect living standards. In addition, building governance structure and local capabilities for sustainable revolving funds in each site was crucial to demonstration of a sustainable and replicable micro-finance model. Different models were expected to be applicable in Lhoka, primarily an agro-pastoral area of south-eastern Tibet, versus Naqu, which is primarily pastoral. Specifically, in nomad areas of Naqu, larger projects and a lack of history of individual responsibility suggested that group loans may be more effective than the individual lending in peer groups likely to succeed in Lhoka.

In the agricultural valleys of Lhoka Prefecture, a micro-finance model was implemented in which RMB 1,000 (US \$121) was lent to women on behalf of their families to be applied to an income-generating activity of their choice. Loans were then monitored by self-chosen peer groups of five. The most popular activity selected was weaving woollen blankets ('nambu'), for which the loan was used as working capital.

In the semi-nomadic plateau of rural Naqu Prefecture, loans were initially made to large groups of households. Loans of RMB 1,000 were thought insufficient for any reasonable income-generating activity; in addition, few nomads were willing to take individual responsibility for a loan, not having any experience with this type of transaction. These loans were mostly used for livestock trading, an extension of traditional activities.

In May of 2000, TPAF began small-scale lending within urban Naqu Municipality, eventually reaching 45 households. Many recipients have started retail operations, either by opening small neighbourhood stores or selling to nomads, or starting up highly profitable guesthouses for long-term migrant workers.

Innovations deemed necessary during the programme included adjustments in repayment schedules, improvements in introductory training, and in rural Naqu, improvements in management structure and reductions in group size. The latter was required essentially because the Naqu model introduced a layer of management into

the lending scheme that was not necessarily well monitored or accountable at a larger scale. As the first round of loans came to an end in 2001, some villagers expressed concerns that delegating management of such large loans to small committees was not wholly effective. There was some dissatisfaction with investment choices and distribution of profits. However, as the nomads had so little experience in income generating activities, it was decided that direct individual lending would be too risky. Therefore, a smaller (five or six households) group approach was agreed upon, and recipient groups formed voluntarily, usually on the basis of living close to one another.

High repayments and high demand for future loans have been preliminary indicators that this is a successful micro-finance programme. There is also anecdotal evidence of an increase in entrepreneurship in some villages, particularly in Lhoka, although this can only be tested as part of a more thorough evaluation – currently a high priority.

Loan repayment rates have been exceptionally high at over 99%. Targeting of households is left to village leaders, who know well the wealth and income landscape in their villages. In Lhoka, loans usually target women from each household. In Naqu, the group loan system makes women's direct participation very rare. In Lhoka, where small groups have been in place since the beginning of the programme, small group meetings have been disappointing; instead of meeting regularly, small groups are informally monitored by their leaders. It is thought that recipients still do not understand how meetings can be useful. In Naqu, the small group system is very new and retains a feeling of hierarchy.

While high repayment rates are pleasing, it may be that TPAF should place less long-term focus on repayment and more on management training of programme officers. TPAF should also resist involvement in dispute resolution, as it could lead to village reliance on outsiders. Further, TPAF continues to rely on outside funding to pay programme officers. Interest payments simply do not cover both costs and salaries. Although most recipients would probably be able to pay higher interest rates, TPAF is precluded from charging anything higher than 3%. Therefore, TPAF will continue to be reliant on new grants to pay overhead expenses.

Pasture development

In April 1998, TPAF launched a project to demonstrate techniques to increase winter forage availability for nomadic families' livestock in 15 villages of Naqu and Nyerong Counties. The assistance included fencing natural winter pasture areas to allow pasture recovery during summer, as well as seeding winter pasture with several native grasses. Fencing of common winter pasture alone resulted in production of an additional 1,871,250 kg of fodder for the 229 poor local families included in the project. This project heightened local interest in large feedlots to maintain livestock weight prior to sale in autumn. However, the experiment also demonstrated that fencing and irrigating near rivers with pumps and small tractors, while effective in promoting regeneration of highly degraded common pasture areas, is still beyond the means of most households.

Water development

Another TPAF project in Naqu was in construction of 14 nomad village wells to reduce human and livestock reliance on polluted surface water for drinking, and thereby greatly reduce the incidence of intestinal diseases and infant mortality. The wells were lined with stone and designed to enable dependable water supplies even during frigid winters. Villagers formed well supervision and maintenance committees, which were trained to supervise well use and undertake simple repairs of the installed hand pumps.

Education

Primary and middle school curricula in Naqu generally lack any vocational content to help prepare youth for the world of work. TPAF is assisting with the implementation of an Education Bureau programme to prepare selected primary and middle school teachers in Naqu and other prefectures to identify local employable skills, develop school curricula to train for those skills, and teach the curricula in their schools. TPAF has been helping train Tibetan trainers, who will in turn train teachers to develop and implement vocational curricula in selected schools.

In Naqu Prefecture, there has been an increasing drift of rural Tibetan youth into Naqu Municipality without the skills needed to secure steady employment. These young people, who have rejected traditional rural nomadic life in favour of urban employment, are an increasing social problem. In order to give these unemployed youths employable skills, TPAF is supporting skills training at Naqu Vocational Training Center.

Rangeland rehabilitation

TPAF is currently implementing a project to demonstrate sustainable range management, recovery, and development practices in selected villages of Naqu's three main ecosystems – alpine meadow, alpine steppe, and desert steppe. Many nomad household surplus fodder production practices introduced earlier in Naqu and Nyerong Counties will be adapted for experimental introduction to these new villages. A central element will be community monitoring and assessment of environmental impacts of winter pasture recovery and development activities. TPAF will also attempt to link microfinancing with rehabilitation work through reciprocal agreements with nomad groups, thus encouraging group investment in rehabilitation costs.

The groundwork for such investment is evident from TPAF's 1998 feedlot development programme, described above, which proved popular in four townships of Naqu and Nyerong Counties. This ongoing programme has provided micro-finance loans to 448 families in ten villages. Loans have generally been for US\$1,200 to US\$6,000, repayable at six-month intervals over two years. Using these loans, many nomad households have chosen to develop fenced feedlots and purchase small tractors to facilitate marketing of livestock and livestock products. Some have also purchased equipment for processing milk products and ground barley ('tsampa') for local consumption.

Where there is No Doctor: Building the Capacity of the Himalayan Amchi to Serve Pastoral Communities

Tenzing Bista¹, Gyatso Bista¹, and Yeshe Choden Lama²

Background and issues faced by amchis

In the pastoral highlands of Nepal, an 'amchi' is very much a doctor – a doctor of multiple skills who provides diagnoses and treatments but who does not have a license to practice. Today, one might find an amchi treating patients in a private clinic in a bustling South Asian metropolis or in a nomad's tent in some remote reach of the Himalaya. Even so, the public perceives traditional medicine as an 'alternative', or a 'last resort'. This is not the case in pastoral communities of the Nepal Himalaya, where an amchi is the only alternative for meeting the health care needs of people as well as livestock.

Motivated by compassion, an amchi devotes his body, speech, and mind to easing the suffering caused by disease. He searches the pastures, forests, and river valleys for medicinal plants and collects the required parts – roots, stems, branches, pith, bark, resin, leaves, flowers, and fruits – to prepare remedies in the form of powders, pills, decoctions, pastes, and concentrates. He also purchases plants and other medicinal ingredients from the lowlands and transports them back to his village.

People living in mountainous areas of Nepal eke out livelihoods in the harsh environment through subsistence farming, animal husbandry, and seasonal trade. In addition to meeting livelihood needs, amchis – who are not compensated for their medical services – face other challenges, such as lack of recognition or support by the government and financial and physical difficulties purchasing medical ingredients.

The growing trade in medicinal plants from the Nepal Himalaya puts pressure on several species and decreases the availability for medicine of key species. This problem is compounded when amchis are unable to access animal parts or endangered medicinal plants protected by law. Livelihood constraints also cause a problem of insufficient training, resulting in incorrect diagnoses and poor quality of medicines. With limited means to purchase medical texts to train new amchis, there is increasing concern about formal transmission of knowledge to younger generations amidst alternative means of livelihood. Even with the recent establishment of schools in the remote districts of Baglung and Mustang, many amchis in Nepal lack access to formal training.

Initiatives to help amchis

This paper examines the role of the amchi in meeting local health care needs and in furthering medicinal plant conservation in the Nepal Himalayas. It describes many current initiatives by and for Himalayan amchis. Below are three examples.

The Himalayan Amchi Association (HAA) was officially registered as a non-government organisation (NGO) in 1998. Based in Kathmandu, HAA enables exchange of knowledge and experience among amchis throughout Nepal and provides a forum for lobbying for recognition and support by the government. The focal points of HAA's

¹ Lo Kufen Mentseekhang and School, Lo Monthang, Mustang, Nepal,

² WWF-Nepal, Kathmandu, Nepal

strategy for promoting the amchi tradition include providing formal training in medical theory, diagnosis, and treatment; improving the quality of medicine produced by amchis; and exchanging information among amchis throughout the Himalaya.

The Lo Kunfen Mentseekhang and School in Lo-Monthang, Mustang was started in 1999 to provide formal education to young amchis, including girls, who wish to pursue medicine. Twenty-one students from Mustang and Dolpa are currently enrolled.

Gangchen Menkhang is a traditional health care centre established in 2000 in Shey Phoksundo National Park, Dolpa, by the amchi of Phoksundo, with support from the WWF-Nepal People and Plants Initiative. A district-level NGO has been registered to manage the centre, which provides health care services to communities inside the park and to students at the nearby Taprizha School, to whom it also provides training in plant identification and use. The health centre also monitors the use of medicinal plants in the area.

The future

Below is a list of several changes that would make the amchis' collective future, as well as the future of the people and natural resources of the Himalayas, much more promising.

- Amchis are actively lobbying for recognition and support by the Ministry of Health. They are interested in establishing a medical school where formal training can be provided, and at which the degrees awarded will be recognised by the government. They also want to be authorised to provide health care services in their communities, since government health posts have not been effective in delivering health care in remote districts of Nepal.
- In China, the amchi tradition has achieved remarkable progress in terms of opportunities for training and practice. Subsequently, there has been a tremendous growth of traditional medical factories, which are sources of income and mitigate amchis' financial problems; however, they have also negatively affected the quality of medicine and ecological sustainability of enterprises. The amchis of Nepal have a unique opportunity to learn from this experience.
- In order to be recognised by the government, amchi medicine must meet requirements for safety and efficacy.
- In the case of rare and endangered species, use of substitutes offers an important option. Many substitutes are already in use in Dolpa and Mustang.
- Amchis' empirical knowledge about the ecology, distribution, biology, and harvesting of medicinal plants is a valuable base upon which to develop guidelines for sustainable use.
- Due to the increasing global trade in medicinal plants and commercialisation of traditional medicine, there is growing concern about the availability of medicinal plants for local health care needs. Although amchis living in urban areas are becoming increasingly removed from the issue of depletion of medicinal plants, those living in mountain areas are very concerned. Many are cultivating species that are rare or that are not available in their districts.
- Younger-generation amchis must be aware of the wider issues confronting their communities. It is no longer enough for amchis to focus only on providing health care. Today, they are confronted with problems of decreasing medicinal resources and must also grapple with the issue of biodiversity conservation.

Towards the Green Belt in Southern Xizang¹

The environmental challenge



Lower Kyi Chu 40 km SW of Lhasa



N-facing flanks along the upper Yarlung Zhangbo



Last residues of juniper shrubs being uprooted in a remote area

The valleys and lower mountain ranges of south-central Tibet have a semi-desert appearance (1). Ancient to recent over-exploitation of the vegetation has caused severe erosion processes and a transformation from the former forest and scrub communities to an open steppe (2). The main result for the local human population is a marked shortage in fuel and construction wood: dung is collected by people as a substitute for fuelwood, which results in a nutrient deficiency on rangelands and fields. The last residues of juniper shrubs (the best firewood and a source of incense) are being uprooted in remote areas along the pass roads (3); in areas where junipers are already extinguished other shrubs are harvested.

Poplar and willow plantations on the valley grounds cover part of the rural demand in construction wood, but they only offer fuelwood of minor quality and need irrigation or a high groundwater table. The dry, non-irrigable mountain slopes are still largely believed to be unsuitable for tree growth.

Project team: Huang Jian, Otsu Tsewang, Tuntsu Tseren, Tu Yanli, Yangchen (Tibet Plateau Institute of Biology, Lhasa), Georg Miehe, Sabine Miehe, Volker Meng, Katja Koch, Kai-Uwe Wollscheid, Armin Schriever (Universities of Marburg and Göttingen, Germany)

Text and photos: G.&S. Miehe, Faculty of Geography, University of Marburg, D-35032 Marburg, Germany; Map: M.Will 2002

Project funds: German Research Council (DFG); Federal Ministry for Economic Co-operation and Development (BMZ), Germany

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http://www.uni-marburg.de/geographie/HPGeo/frames/fr_personal.html

¹ A field trip was arranged to look at the first results of an applied research project aiming at the rehabilitation of degraded rangelands in the area of Lhasa. Sabine Miehe prepared background information on the site and project in the form of a poster - which is reproduced here in full.

The environmental potential



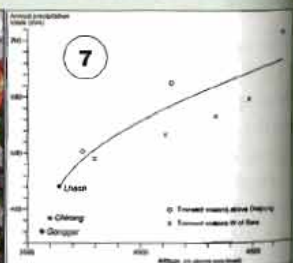
Juniperus/Sabina convallium above Chirong village, c 40km SW of Lhasa

Tree relics on inaccessible cliffs at 4600m above Lhasa

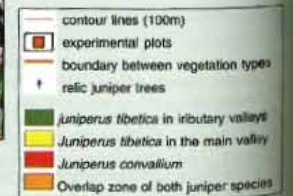
Tree relics on inaccessible cliffs (4) or under religious protection (5) suggest that the area might potentially be forested, at least with junipers. A comprehensive inventory of relic juniper populations undertaken in 1995-99 in collaboration between the Tibet Plateau Institute of Biology (TPIB), Lhasa, and the Faculty of Geography, University of Marburg, Germany, allowed extrapolation of the potential cover of juniper forests in the Lhasa region (6). Annual rainfall totals, averaged from measurements along two altitudinal transects above Lhasa (7) indicate that the lower slopes are far from the drought limit of juniper trees (c 250-300 mm/a) and the higher slopes receive precipitation totals that are comparable to those of well-known forest areas in Xizang. This is still below the upper treeline (c 4800m).



Potential cover of juniper forests in the Lhasa region



Annual rainfall totals along two altitudinal transects above Lhasa



Evidence of the forest potential



Juniper and cypress seedlings cultivated in an experimental nursery in the TPIB

To provide experimental evidence of the forest potential, juniper saplings were raised from seeds collected in the nearest relic stands (5) and cypresses from seed resources near their actual western distribution limit (Laangxian). The seedlings were cultivated in an experimental nursery in the TPIB for 1-2 years (8). In 1999 and 2000 plantation trials were undertaken on fenced experimental plots between 3750 and 4170m above Lhasa. Despite the short cultivation period (at least 3 years recommended for the forestry practice), the survival rate of saplings averaged 18% in the 1999 plantation and almost 100% in the 2000 campaign. The saplings were only watered in the nursery and at the time of plantation. Now they are growing without any supplementary irrigation (9).



Cupressus gigantea, 60 cm tall after 2 years growth with monsoon rains only

Thus, the eroded semi-desert landscape of S Tibet has a huge potential for afforestation measures that could

- a) meet the strong demands for wood
- b) help to combat erosion on overgrazed slopes
- c) improve the degraded pastures.

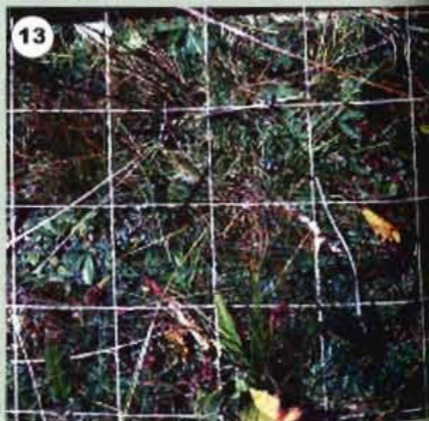
Combining afforestation with rangeland regeneration



Exclosure plots established in Lhasa (left) and Reting (right)

Grazing must be excluded from afforestation plots until the trees are strong enough to resist trampling and browsing. In this way rangelands may regenerate from overgrazing simultaneously. The optimum length of the ungrazed period, however, varies with altitude, humidity, soil conditions and the degree of degradation. Successional trends observed on the exclosure plots established in Lhasa (10) and Reting (11) suggest that the drier the climate and the lower the initial cover degree of the herbaceous vegetation, the longer will the ungrazed period be beneficial for pasture regeneration. In the more humid areas, where dense secondary *Kobresia* pastures grow within the potential forest belt, the herbaceous vegetation will regenerate as well, but the quality and resilience of the pasture might decrease in the long run.

Example: plot 'Reting II', 4625 m, fenced in 1997 (12), revisited in 2001 (13): strong regeneration of the herbaceous vegetation towards a closed ground cover in several layers. The tough and tiny sedge *Kobresia pygmaea*, dominating the vast alpine yak pastures, is overgrown by herbs and taller grasses, which might have negative effects on the rangeland ecosystem if grazing is excluded for too long.



Plot 'Reting II', 4625 m, fenced in 1997 (top), revisited in 2001 (bottom)

Issues for future research and action

The main issues for future inter-disciplinary research and action in cooperation with the local communities are:

- Under which conditions are juniper-wooded rangelands sustainable?
- How long do unirrigated juniper plantations need to be protected from grazing?
- How long is protection from grazing beneficial for which type of rangeland?
- How can we realise medium-term rotations of rangeland utilisation (fencing materials, herding practices...) in different rural communities?

4 Enabling Institutional and Policy Change to Support Collaborative Pastoral Development and Rangeland Conservation



Cover photo: Participatory Planning in Yushu Tibetan Autonomous Prefecture, Qinghai, PRC
(*Camille Richard*)

4

Enabling Institutional and Policy Change to Support Collaborative Pastoral Development and Rangeland Conservation

Participation has been mentioned previously when talking of integrated approaches; however, many of the following presentations describe participation as a driving force in the process of development and conservation initiatives. Participation here involves not only institutional building of the local communities, but also building the capacity of government and non-government institutions to facilitate local learning processes and improve service delivery to pastoral communities that meets both local needs and those of society at large. The last two papers deal with grassland tenure policies as a basis for collaborative management, providing the security and incentive for communities to participate in rangeland improvement and development schemes. All papers emphasise that effective collaboration among local and government stakeholders requires a supportive extension, research, and policy environment that is adaptive to change and responsive to local needs, knowledge and aspirations.

Dr. Ahmed Sidhamed presented a major institutional perspective and experiences of the International Fund for Agricultural Development's (IFAD) livestock and rangeland development projects over the past 25 years. He provided an overview of IFAD's overall approach to alleviating poverty amongst pastoral communities, including the technical, financial, institutional and policy support needed to enable community-based development, with particular emphasis on enhancing the role of civil society in the development process.

Du Guozhen and Zhao Qun present two papers describing an Oxfam supported project in Maqu County in Gansu Province of China. In this project, the objectives were predetermined by the government and project staff, but participatory training and implementation have greatly facilitated success and helped to improve the participation of marginalised members of the communities in decision-making and benefit sharing.

Rinchen Wangchuk from the Snow Leopard Conservancy presented their approach to developing alternative models for the conservation of endangered rangeland wildlife, such as the snow leopard, while helping to enhance local livelihoods. Particular focus is given to the process of appreciative participatory planning and action (APPA) as a means to help alleviate predator-wildlife conflicts in pastoral regions such as Ladakh, India.

Wolfgang Bayer from GTZ presented the results of a study of participatory monitoring and evaluation efforts around the globe. Using outcomes of this work, he identified situations where participation is appropriate and the conditions necessary to facilitate effective implementation and monitoring.

Tsewang Wangchuk from the Jigme Dorje National Park in Bhutan highlighted the integrated nature of Bhutan's natural resource policies. He then presented a participatory planning process for rangeland conservation work in the park that is integrated into government planning and implementation.

Ayurzana Enkh-Amgalan from the centre for Policy Research in Mongolia described the results of a project that registered informal grazing rights of customary herding communities, and assisted herders to adopt more sustainable strategies of income generating, emphasising a holistic and participatory approach. He argued that the revolving funds provided, which were used by the communities as loans, were well used as they built capacity, unlike relief assistance.

Mohammed H. Emadi from the Iran Ministry of Agriculture presented an approach taken by the government of Iran to improving the working relationship between its agencies and nomad communities. As a basis, he emphasised the importance of helping different actors understand each other's perspectives, especially those of the local communities. He then described a series of steps designed to bring about organisational change within the Department of Forests and Rangelands to develop a collaborative learning process with local herding communities.

Li Ping from the Rural Development Institute in Beijing highlighted important policy considerations regarding tenure arrangements for rangeland (non-arable) conditions in China. He argued that tenure policies developed for arable lands are not appropriate and that a coordinated effort is needed to bring a local voice into the process of policy formulation and change that reflects the unique rangeland ecosystems and socioeconomic conditions of local herding communities.

Yan Zhaoli presented findings of an ICIMOD supported study on policy impacts and institutional training needs to improve implementation of China's Grassland Law in Tibetan areas of Sichuan Province. Local communities view the policy itself as sound and flexible but feel that those mandated to implement it are neither capable nor are they responsive to local needs. She suggests development of effective implementation guidelines that can be tailored to specific site conditions and training of government staff in facilitating local decision-making in policy implementation efforts.

IFAD's Experience In Supporting Community Based Livestock and Rangeland Development

Ahmed E. Sidahmed¹ and Antonio Rota¹

Rangeland issues

As a result of insufficient and unreliable rainfall, rangelands cannot maintain cropping activities. Therefore, rangeland use is predominantly by livestock. Although livestock grazing is the most efficient way to convert cheap primary production on rangelands into valuable animal products, most pastoralists are among the world's poorest people. The rangelands on which these people live are marginal and fragile,

¹ IFAD, Rome, Italy

with extreme weather conditions, low rainfall, rough terrain, high altitudes, and poor soils; as well as poor access to roads, markets, and services. Most of these rangeland ecosystems are subject to overuse, and their degradation is intensified by sharp increases in human and livestock populations.

Nonetheless, rangeland users have been persistently overlooked by planners and policy-makers, and until very recently, lack of understanding of rangeland vulnerability caused those policy initiatives that did occur to be misguided, further contributing to the instability of many rangeland ecosystems. All of these factors have combined to cause wide-scale degradation of many of the world's rangelands.

There are several historical reasons for the extreme poverty of many pastoralists, exacerbated by some new ones. Historically, pastoralists are vulnerable to severe winters and droughts. Insecure land tenure and use rights, or complete lack thereof, often lead to loss of grazing areas. The forage of some rangelands is of poor nutritional quality. New difficulties include the fact that increasing numbers of livestock are using the same limited range resources, causing accelerating land degradation. Furthermore, in this age of world markets, alternative income-generating activities, financial assets, and health and education services are not available to these people.

The consequences of this poverty and the resulting degradation are decreasing stability of the natural resource base, continuing loss of ecosystems and biodiversity, decreasing livelihood security, and sometimes conflicts or wars.

IFAD

The International Fund for Agriculture Development (IFAD) is a United Nations specialised agency established as a result of the recommendations of the 1974 World Hunger Conference. IFAD's mission is to work with the poorest rural populations in developing countries to eliminate hunger and poverty, enhance food security, raise productivity and incomes, and improve the quality of people's lives through empowerment and improved access to productive resources.

IFAD searches for innovative approaches and mobilises its own resources, as well as the resources of the international community, in a global effort to combat hunger and rural poverty in the marginal and resource-poor areas of the world. IFAD's strategy is to mainstream and incorporate the interests and needs of poor pastoralists and small, mixed crop and livestock producers into their national economies. This is being achieved through strengthening of the social, financial, legal, and technical coping abilities of rangeland users. The majority of IFAD's rangeland projects are in sub-Saharan Africa, the Near East or North Africa, and Central Asia.

IFAD's most recent projects have employed multi-sectoral community-based support. These programmes include complex projects designed to support mixed communities of nomads, transhumants, and traditional farmers and often provide social services such as health, water, education, and community training. These new, advanced IFAD projects have sought integrated solutions to social, economic, and technical constraints and have formulated and enforced supportive policies and reform measures.

One example is a project conducted on semi-arid steppe rangeland in Morocco, where community-based structures were developed for the adoption of technical solutions to

reverse severe rangeland degradation. Consensus was built among the various tribes concerning how to use and improve the available degraded rangelands. Democratic and legally sanctioned 'ethnolineal' cooperatives were established, on the basis of tribal structures and ancestral rights, to control the use of over three million hectares of rangeland.

IFAD projects have also established laws enforcing incremental taxes on larger herd sizes in China, Mongolia, Azerbaijan, and Georgia. These laws reduced overgrazing and afforded poor smallholders access to common grazing resources. In addition, an IFAD investment project in Mongolia allowed for collection of an incremental tax on range use.

Future IFAD projects

After learning many lessons, IFAD has developed a new participatory rangeland development programme. Under this programme, range users themselves are the focal points for development, and their coping mechanisms are the benchmarks. It is less supportive of public institutions and intensively supportive of rural communities' self-management and self-reliance. It searches for equitable solutions and establishes enabling frameworks to allow the communities most affected by environmental destruction to take leading roles in identifying and implementing possible solutions.

Institutions at both the community and state levels play crucial roles in making development projects work. Institutions at the community level are in the best position to assure full participation and benefit of all categories of herders, from the poorest to the richest. They also formulate resource management action plans, participate in negotiating the plans with policy-makers, and ensure their implementation. State and other government institutions ensure provision of minimum services and funds, as well as define and ensure the overall legal and judicial frameworks for lower-level institutions.

IFAD's experiences make it clear that any attempt to support rangeland development in the future must be built on traditional pastoralist livestock systems that focus on sustainable natural resource management, risk minimisation, and the preservation of diversity. Such development must also recognise the complexity of the social, economic, and natural factors involved. A community planning approach to the development of pastoralists fosters integration between different actors, including communities, local and national institutions, and policy-makers. It stimulates participation in steering the development process, facilitates participatory identification and transfer of useful practices, and promotes collective action on the basis of shared consensus.

Community-based Rangeland Management in the Alpine Meadows of Maqu County, Gansu, PRC

Du Guozhen¹

Background

The Qinghai-Tibet Plateau is the highest and largest plateau in the world. This area, with its unique ecosystem and an extremely rich rangeland resource, has been one of the most important grazing lands in the region since ancient times. The high-frigid meadow of the eastern Plateau is a central point for rangeland animal husbandry and also the origin of the Huanghe and Yangtse Rivers; it is thus called 'the mother of ten thousand rivers'. The Qingzang Plateau is the starter and modulator region for the climate of the northern hemisphere. Changes in its climate have immense effects on the climates of eastern and southwestern China, as well as on the northern hemisphere and the entire globe. Furthermore, the high-frigid meadow ecosystem has immense and unique biodiversity and animal breed resources. Environmental changes in this region directly affect the whole of China, and thus the lives of all Chinese people. Therefore, the Qinghai-Tibet Plateau has attracted the attention of meteorologists, soil experts, environmental specialists, and ecologists from all over the world.

Maqu County is situated in the region of the first bend of the Huanghe (Yellow) River. The area receives high rainfall, and soil dampness is optimal for typical high-frigid meadow vegetation. This natural grazing land is very rich in primary productivity relative to the rest of the Plateau. However, due to overgrazing and long-term improper rangeland utilisation, the ecosystem has become seriously degraded, leading to many livestock deaths. This rangeland degradation is manifested by a drop in rangeland productivity, serious harm caused by small burrowing mammals, an increase in poisonous grass species, and an increase in bare land area.

The Tibetan people living in Maqu County have historically led nomadic lives. They have used the rangeland for migratory grazing, in which a tribe or a group of herders were considered a unit, and have used different types of rangeland during different seasons. In 1982, livestock were contracted to individual families in Maqu County, as had been done in other parts of the country. After the implementation of the 1985 Grassland Law in the early 1990s, livestock were restricted to their owner's specific areas of rangeland and not allowed to 'trespass' on neighbouring areas. This has caused many problems, such as controversy over winter and spring pastures located between families and villages, lack of funds to fence land for conservation and fodder production improvement, and decreases in drinking water availability.

The current project

The problems raised by the contracting of rangeland to individual families have attracted the attention of the Chinese government at all levels, as well as of distinguished people in various fields. The State Laboratory for Arid Agricultural Ecosystems at Lanzhou University conducted a study of these problems and put forward suggestions to various levels of government and to Oxfam Hong Kong. This three-year project, begun in 1999 in Nima and Oula townships of Maqu County, has made remarkable achievements in the social, ecological, and economic spheres.

¹ State Key Laboratory of Arid Agroecology, Lanzhou, Gansu, PRC

Following the mandate of the proposal by Oxfam Hong Kong, topics were selected using a participatory discussion approach. First, a survey group was formed of scientists, local technicians, and government officials. This group then approached local herders in Maqu County, discussed with them the problems existing in rangeland animal husbandry, and asked them which problem they considered most compelling. Beneficiary families were then selected through active herder participation.

During project implementation, three types of personnel training were arranged – technical, general, and herder training. Technical training focused on the characteristics of high frigid rangeland, principles of surveying and evaluating rangeland, questions relating to rangeland improvement and conservation, methods of planning for rangeland improvement and conservation, and skills for monitoring rangeland vegetation condition. General training covered participatory project management, skills for spreading technical knowledge to the grass roots level, modes of coordination among stakeholders, and transparent financial project management. Herder training covered simple rangeland management techniques, uses of traditional knowledge, significance of participatory management, and the concepts of 'equality' and 'democratic management'.

Outcomes and recommendations

Popularisation of this project has had long-lasting effects on the attitudes, outlooks, and modes of management of local governmental officials, cadres, and technicians. Implementation of this three-year project has changed the working style of governmental officials remarkably, as they have witnessed the benefits of participation of people from different backgrounds in the implementation of projects. Through both on-the-spot and periodic training, technicians' technical knowledge and capacity to work with herders were also enhanced. Relations among herders have been improved in many ways by the project. For example, herders are now working together to devise the best ways to manage their particular rangeland, and poor herders are being supported through the participation of the entire community.

Popularisation of technical skills on the rangelands of the Plateau is a very complex issue. In addition to technical skills, it involves societal background, cultural customs, and level of economic development. Therefore, it is necessary to gather ideas from different groups of people – especially from herders themselves – in order to implement projects smoothly.

Some specific suggestions are listed in the following.

- Different stakeholders, and especially herders, should participate in all projects implemented on the rangeland.
- All technical measures to improve rangeland should be integrated into participatory management.
- Based on the wishes of herders, village rules for combined use and management of rangelands should be improved and utilised.
- Basic scientific research on new technical skills should be conducted before the skills are spread among herders.

Integrated Application of Technical Skills and Participatory Approaches in Rangeland Improvement in Pastoral Areas

Zhao Qun¹, Ma Jianyun² and Niang Maojia²

Background

Animal husbandry is the only source of livelihood for the local Tibetan people of Maqu county, Gansu province, China. Increases in human and animal populations per unit area of rangeland in recent years, in addition to improper grazing practices and natural factors, have caused severe degradation of Maqu rangelands. The main manifestations of this degradation are a decrease in the proportion of superior fodder grasses in the vegetation of the region, overgrowth of poisonous and non-fodder grass species, and burrowing mammal and insect disasters. Therefore, rangeland improvement techniques are recognised as important for pasture development.

Local traditional grazing practices include several management methods very useful for rangeland improvement. These include the prohibition of rangeland tilling, differentiation of winter-spring pasture from summer-autumn pasture, the practice of rotational grazing in two of the four seasonal pastures, and growing of oats for winter feed supplementation. Herders have also established organisations to regulate common pasture use, including regulations on livestock numbers. These organisations are especially useful for development projects, as they can make decisions, spread information among herders, and organise herder activities.

The present project

An Oxfam Hongkong supported project was carried out from April 1999 to September 2002 and involved 100 typical poor families from Maqu County. The project objectives were to increase the productivity of rangeland animal husbandry and to stop the degradation of rangeland by constructing artificial pastures and improving natural pastures. The project attempted to enhance the sustainable economic development of poor local herder families, while improving the environment by protecting available resources. Project staff worked to adapt the project to the local natural, cultural, and historical situation. Each of the project families was given five mu [1 mu is approximately 1/15 ha] of land on which to grow highly productive fodder grass. The project also facilitated improvement of 150 mu of rangeland per family through eradication of small burrowing mammals, grass plantation, fertiliser application, weed removal, and enclosure of pasture. The participatory approach was introduced to this project through step-wise reviews conducted jointly by project technicians and herders and through training sessions at various stages of project implementation.

Lessons learned

During the process of project implementation, project managers learned that in order to enhance project sustainability, the following crucial issues must be considered:

- project staff's familiarity with and enthusiasm about the participatory concept
- formation, self-management, and productivity of herders' groups
- gender sensitivity and women's participation
- adaptability of new techniques and ability to assimilate herders' experiences

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² Maqu County Grassland Management Station, Maqu County, Gansu, PRC

These issues were considered throughout the project and are discussed individually below.

To enhance project staff capabilities with participatory methods, staff training sessions were conducted using a participatory approach. The main content of these training sessions was participatory project management, participatory monitoring and evaluation, participatory mid-term project review, and gender issues and social development. The subject matter of this participatory training was associated with the actual implementation of the project.

Pre-existing herders' groups function in cooperation and decision-making and can encourage herders to participate in project design, implementation, management, popularisation, and evaluation. This increases herder levels of participation and ownership, and empowers herders to discuss problems, put forward solutions, and seek support from donors. Herder group participation in management, implementation, monitoring, and evaluation helped technicians discover technical, financial, temporal, and labour problems faced by herders in constructing artificial pasture, harvesting and storing fodder, and improving natural pasture. Technicians and herders then discussed ways to solve these problems and revised and improved the project design and implementation. All of these steps had long-term effects on sustainable project development. In light of local herders' groups' regulations and knowledge of rangeland management, staff of the project delegated responsibility for certain decisions to the herders themselves. One decision made by herders regarded how much natural pasture to improve and how much artificial pasture to create.

A comprehensive analytical study was conducted on the gendered division of labour relating to project activities; division of labour and decision-making between men and women was found to be unbalanced. Women provide the main labour force for both family production and community economic development. Since women provided labour for this project, their feelings and opinions needed to be reflected. This project enhanced their decision-making rights and capabilities and brought them more respect in their society. Several activities enhanced project women's ability to participate. Timing of training sessions and services was arranged to female participants' convenience. In the initial stage of the project, families consisting of women and children only were identified as important to support. They were not only beneficiaries, but also participated in project design and evaluation. Project staff also had discussions with women and later conveyed their opinions to the larger group. Throughout the project, timely intervention was carried out on crucial gender issues.

Use of herder wisdom made this project more successful in several ways. For example, herders suggested a change in time of oat planting to avoid wind damage. They suggested raising the utility of enclosed pasture, while reducing the workload of fertiliser application, by grazing goats and sheep at an appropriate time for an optimum duration. They also came up with the successful idea of eradicating small burrowing mammals by closing the holes with mud. Herders' notion of non-violence was expected to be a great obstacle to pest eradication in this project. However, herders had already come to understand the importance of this to prevent grassland degradation. They supported technicians in eradication efforts, and during the process, learned to apply the techniques themselves. Research is required on traditional animal husbandry knowledge and its similarities and differences with new technical skills and on how the spreading of grassland improvement skills affects herder lifestyles.

A Community-based Approach to Mitigating Livestock-Wildlife Conflict in Ladakh, India

Rinchen Wangchuk¹ and Rodney Jackson²

Background

Livestock depredation by snow leopards and wolves is widespread in Hemis National Park, Ladakh, India, which covers 3,350 sq km of the trans-Himalayan range of Ladakh. The Park contains prime snow leopard habitat and harbours four species of wild sheep and goats, giving it international biodiversity importance. About 1,600 people live in 16 small settlements in the Park, scattered across three valleys.

A key management issue is the increasing complaints of livestock depredation by snow leopards and wolves. During 1997-1999, local villagers reported losing 492 animals to predators in a 14-month period, about 12% of the total livestock herd and valued at an estimated US \$23,500. Mean annual household loss was estimated at 6.2 animals, an average value of \$297 per family. The most significant and adverse impact occurs when a snow leopard enters a poorly constructed corral and wounds or kills all of the sheep and goats inside, which cannot escape the enclosure. These mass killings account for nearly 50% of livestock losses to predators.

In 1996, the Jammu and Kashmir Wildlife Department's Ladakh office initiated a compensation programme for the local population. However, lack of funds and cumbersome registration claim procedures often caused herders to hike for several days to the office in Leh, only to wait for two or three years for compensation which when it came was insufficient for the effort invested. At this point, the Snow Leopard Conservancy (SLC), an international non-government organisation, became involved, with the aim of addressing the root causes of depredation losses.

The project

The SLC project used appreciative participatory planning and action (APPA), a sequential, reiterative process seeking to 1) discover community strengths and valued resources; 2) envision short and long-term futures, assuming that necessary resources are suitably mobilised and the community acts in concert; 3) design a basic action plan for guiding development and nature protection while limiting long-term dependency upon outside financial sources or technical 'know-how'; and 4) motivate participants to initiate community-improvement actions immediately on their own, rather than delaying the process indefinitely.

Exercises during the participatory 'discovery' phase in all five selected settlements implicated poorly constructed livestock pens and lax daytime guarding practices as the primary causes of depredation. The next step entailed envisioning how each village might look within a time frame of one to two years (short-term) and five to ten years (long-term) if the community acted to reduce predation losses, protect snow leopards and other wildlife, and successfully enhance their income-generation skills.

Participants readily concurred that virtually all existing corrals were poorly constructed, with low and flimsy walls offering little to no deterrent to a predator

¹ Snow Leopard Conservancy, Leh, Ladakh, India

² Snow Leopard Conservancy, Los Gatos, CA, USA

intent on an easy meal. Thus, the remedial measure most supported by villagers was predator-proofing of night-time corrals and prevention of multiple killings of livestock, followed by herder education to improve day-time guarding and animal husbandry practices, and protection of the natural prey base. Participants designed and constructed predator-proof night-time enclosures with strong, high walls, mesh wire covering the roofs to preclude any access from above, and well-made wooden doors. Corrals constructed in a top-down manner had been less well designed; for example, some were placed adjacent to cliffs along which a snow leopard may gain easy access to the tightly packed livestock within the three-metre-high walls.

The action plan for the new corrals specifies details such as where to build, who is responsible, what are the required inputs, how many are required, when to conduct activities, how to implement, and how to monitor. Participants produced drawings illustrating the improved livestock enclosure, along with related design documentation on enclosure dimensions and required materials. In order to avoid encouraging an increase in livestock numbers, we ensured that the improved facilities are no larger than the existing structures they are intended to replace. It was also important to agree upon what could and could not be realistically achieved in terms of reducing loss, and to understand the impossibility of eliminating all livestock depredation from an area.

Using a poster depicting good and poor animal husbandry practices and illustrating examples of economic and social benefits of protecting wildlife, we explored ways in which wildlife can benefit local people. Rather than trying to establish an unfamiliar activity or economic system, we looked at how communities might improve upon what they are already doing. Since adventure trekking is well established in Ladakh, local people needed help capturing more tourist dollars without increasing their dependency upon tourism in these uncertain times. We concentrated on skills training for operators of 'parachute cafés' and will help villagers develop home-stays in the future.

Conclusions

APPA is a powerful tool for instilling pride in herders and farmers by highlighting positive community attributes and building upon traditional values and successes. This approach is highly effective in mobilising rural communities toward greater self-reliance, and thus a more harmonious long-term relationship with the national park in which they live and upon the resources of which they depend for their livelihoods. It is apparent that corral predator-proofing can be very effective in reducing losses and alleviating conflict due to livestock depredation by snow leopards. As our experience in Ladakh demonstrates, enhancing existing structures can be accomplished inexpensively and with considerable input from local communities. It is now widely acknowledged that the future of most protected areas hinges on the degree to which local people's concerns, needs, and aspirations are addressed by conservationists. A promising approach rests in promoting a set of carefully designed and monitored community-based stewardship initiatives, in which local people offer visitors good wildlife viewing opportunities, local nature guides, traditional home-stays, attractive camping sites, and/or handicrafts. Wherever possible, we believe that corral predator-proofing should be implicitly linked with specific conservation measures and initiatives to enhance local incomes.



How Much Participation? Experiences with Participatory Approaches in Pastoral Settings

Wolfgang Bayer¹ and Ann Waters-Bayer²

Background

Rangeland management is a difficult aspect of development cooperation, as there are no universally applicable development models for rangeland areas. Recently, however, governments and development agencies have shown increasing interest in participatory approaches for rangeland management and pastoral development.

Development projects involving interventions in rangelands commenced about 40 years ago. In the 1960s and early 1970s, the emphasis was on technology transfer, increasing production for urban and international markets. This was largely based on the American ranching approach. In the 1970s, it became increasingly clear that, for ecological, economic, and institutional reasons, this approach was not appropriate in many regions. Analyses of ranching project failures revealed that existing pastoral systems had been poorly understood. Resulting analyses of pastoralism found highly efficient resource use among traditional pastoralists, rich indigenous pastoral knowledge, multiple functions of rangelands, inadequacy of conventional ecological theories, and threats to sustainable pastoralism from policies based on paradigms of sedentary land use.

Nonetheless, participatory development projects did not become mainstream until the early 1990s when they became fashionable in Africa, at which point there was much confusion. This was especially so in pastoral development, as most official project planners lacked pastoral backgrounds and regarded sedentary life-styles as superior. Hence, proponents of participatory rural appraisal (PRA) and its offshoot, participatory learning and action (PLA), saw the need to classify participatory approaches following a line of growing involvement, responsibility, and ownership of project measures by local people and a parallel diminishing of decision-making by government officials and project staff.

In 1993, the German Agency for Technical Cooperation (GTZ) commissioned a review of participatory approaches in pastoral settings, with a focus on Africa. They found that participatory approaches were largely restricted to the stage of situation analysis. Development workers and government officials often defined key problems differently than did pastoralists. Data collected was predominantly qualitative or semi-quantitative. A variety of methods were used in pastoral settings. Use of participatory methods mobilised community enthusiasm, but also created high expectations. And, participatory approaches required a change in roles of actors in the development process.

The study

Some GTZ personnel consider participation a key to sustainable development, and they recently commissioned a follow-up review of participatory approaches in pastoral development, this time focusing on participatory monitoring and evaluation (PM&E). They found that much of what has been documented about M&E in pastoral settings

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is not what they would consider participatory, as it does not focus on local institution building or project accountability to partners. Some other main findings of this recent review are that although M&E projects with certain major international donors increasingly contain participatory elements, non-government organisations (NGOs) are at the forefront in developing PM&E approaches designed to strengthen local capacities. The most common topics to which PM&E is applied are water development, community-based veterinary services, local institutional development, conflict management, and participatory experimentation. The main tools used in PM&E are the same as those used in situation analysis and project planning, covered in the 1994 study. Systematic PM&E requires answers to several important questions, which frequently go unasked.

GTZ also concluded that PM&E cannot provide all the information needed by all stakeholders. As data requirements among stakeholders can differ substantially, conventional and participatory M&E can be conducted as different aspects of the same project. There are even situations in which PM&E is not appropriate.

Conclusions

Local people normally understand local conditions and processes quite well. What they may not understand so well are the motives and reasoning of government agencies that must cater not only to a group of pastoralists but also to a nation as a whole. International relations are probably beyond the understanding of most pastoral groups.

International and national agencies concerned with desertification attach much importance to rangeland monitoring. If this is going to attract pastoralist participation, it must be useful to pastoralists. Useful monitoring requires an efficient institutional system that allows pastoralists to make better daily decisions in pasture and water resource management and caters to their long-term concerns.

A certain degree of institutional maturity among pastoral communities is a prerequisite for effective participatory planning, implementing, monitoring, and evaluating of rangelands and development projects. These institutions must be capable of acting as and when necessary.

A central concept in participatory approaches is subsidiarity, which calls for higher levels of organisation to take on only those issues that lower levels cannot handle competently. In this spirit, it should be the local people who decide how to conduct their M&E and whether participation of outsiders is needed to achieve their goals. Likewise, higher echelons of organisation must consider whether they can better achieve their goals with or without the support of local people. Participation is always a process of negotiation.

Development support organisations should embark on participatory approaches to pastoral development only if they are prepared to commit themselves to long-term partnership. The processes of building mutual trust, developing local capacities, and strengthening local institutions are slow. PM&E can enhance pastoral communities' capacities to manage their own development, but the PM&E approach must build upon local needs and areas of responsibility. Trying to impose a PM&E system to satisfy donors' demands or to generate information that local people do not need and cannot use is a contradiction in terms.



Integrating Yak-herding Communities into Conservation and Resource Management Planning Processes In Jigme Dorji National Park, Northwest Bhutan

Tshewang R. Wangchuk¹

Background

Jigme Dorji National Park (JDNP) was established in 1974. Located in north-western Bhutan, it is the largest protected area in the country, encompassing 4,349 sq.km. It stretches from warm broadleaved forests to snow-capped Himalayan peaks and harbours plant and animal assemblages representing various ecosystems within a short lateral distance. As well as being an important area for medicinal plants, the Park provides habitat for predators such as snow leopard, tiger, and Himalayan black bear, supported by ungulates such as Bhutan takin, musk deer, and blue sheep. Pheasant-like species such as monal and satyr tragopan abound in the forests, and red panda has been recorded in temperate broadleaved forests with thick bamboo undergrowth at much lower elevations than elsewhere in its range. The presence of these animals out of their conventional ranges is a matter of interest requiring further investigation.

Perhaps the most influential component of the JDNP ecosystem is the resident community of roughly 6,500 people, who rely directly on the Park's natural resources. They have coexisted in this environment for centuries, utilising resources sustainably. These alpine herders' major source of income, and of a whole array of necessary products, are yaks, whose sure-footedness and toughness make them excellent for transporting provisions in the rough and snowy mountain terrain or as draught animals to plough fields.

Issues

With improved animal health services and increasing human population, pressure on rangeland resources is on the rise. Sustainable management of rangelands and efficient animal husbandry practices are thus crucial for socioeconomic development.

However, conservation of biological diversity has been given high priority by the government, and development planning cannot be at the expense of ecosystem stability. Bhutan, with its relatively low population scattered over numerous valleys, has been able to maintain a balance between resource utilisation and conservation, and has thus been globally acclaimed. The government has recently formulated strong conservation policies, including a protected area network comprising about 26% of the country, connected by biological corridors comprising another 9%. However, conservation has often been blamed for increasing problems of livestock and crop depredation by wildlife. Wildlife damage to crops and livestock, and encroachment and fragmentation of farms by forests, have made it exceedingly difficult for farmers to manage their farms.

It is easy to attribute recent increases in wildlife populations to conservation. However, when the Bhutan Forest Act was enacted in 1969, many early development efforts were also taking place. Another cause of increasing 'pest' animal populations was extirpation

¹ WWF-Nepal, Kathmandu, Nepal

of predators in the early 1980s. Poison administered by farmers in animal carcasses to get rid of wild dogs did not discriminate between species, and thus eliminated various non-target predator species such as leopard, and sometimes tiger.

One school of thought holds strict conservation rules, such as the 1969 ban on all forest fires and hunting, responsible for wildlife-related problems. This school assumes that with more lenient rules, forest fires and hunting would limit problem animals. This school thus blames conservation for wildlife-related problems on farms. The hunting ban may have resulted in a rise in livestock depredation by predators, especially in alpine areas by snow leopard. However, the true cause for this change is a complicated web of factors, including an increased presence of field staff and a resulting increase in reports of livestock depredation incidents, and farmer anticipation of financial compensation.

When humans and wildlife co-exist, conflicts are bound to arise. In the lowlands of Bhutan, cattle are lost to leopard, tiger, and wild dog. In the mountains, snow leopard, Himalayan black bear, and Tibetan wolf attack yaks and calves. There is competition between yaks and blue sheep in the fall, when male blue sheep come lower to mate, and in the winter, when forage is scarce. Mastiff guard dogs scare away wildlife, sometimes attacking blue sheep, and have been vectors of disease in yaks, which might be passed on to wild ungulates. Destruction of regenerating plants by livestock has been well documented in forests and meadows. In broadleaved forests, increasing dominance of invasive or low-seral plant species indicates a decline in fodder quality. Grazing has also been found to reduce the number and density of broadleaved tree species.

There are also positive relationships between livestock and biodiversity conservation. Rice terraces are enriched with organic manure from cattle sheds. Livestock grazing maintains the openness of valley floors, creating habitat favourable to takin. Young shoots of dwarf bamboo and *Arundinaria* are nipped by livestock, preventing them from growing tall and producing winter habitat for black-necked cranes.

Future development

Bhutan's development philosophy is based on a balance between sustainable resource utilisation and environmental conservation. It focuses on equitable distribution of costs and benefits and accommodation of religious, social, and cultural values. JDNP works with local residents, other government agencies, and relevant stakeholders to assess resource use patterns, identify constraints, and develop sustainable management plans. Plans for all ten major communities within the Park are currently in the process of completion. The first community-based resource management plan has been implemented in the community of Laya, and experiences gathered are being used to replicate the work in other communities. These plans are integrated into local geog level (smallest administrative unit in Bhutan) planning processes so that park management plans are part of normal government functions.

The planning process in Laya involved building the capacities of village elders, government extension agents, planners, and Park staff. A series of workshops and training sessions was held. Extensive fieldwork was carried out using participatory rural appraisal, rapid rural appraisal, participatory learning and action, and community meetings. This resulted in feasibility studies describing specific problems to be solved and strengths and opportunities to be utilised. To realise objectives,

planning must be approached from a comprehensive angle. To conserve biodiversity, pressure on natural resources must be reduced, and sustainable management alternatives must be investigated. The socioeconomic implications of such activities must also be understood.

Holistic and Community-based Approaches to Building Sustainable Livelihoods for Herders in Mongolia

Ayurzana Enkh-Amgalan¹

Background

The extensive livestock industry of Mongolia provides almost half of national employment; yet, it remains largely a subsistence economic activity. The major characteristics of this extensive livestock industry are its absolute dependence on an extremely harsh and highly variable natural environment, and the resulting low and basically constant yield per animal over time.

With the transition of the Mongolian economy to a market-oriented system in 1990-1991, the extensive livestock production system developed over the previous 30 years collapsed. The government privatised the ownership of stock, and after long years of central planning, stood back and left the industry to reorganise itself. During the past 10 years of transition, the dominant policy was to pursue livestock privatisation and price liberalisation, expecting the market to do the rest. This had some drastic and unexpected effects. Individual herders' interests in maximising livestock numbers contradicted the national interest in ensuring long-term sustainable development of the industry by maintaining the potential of pasture resources. Small households lacked resources for providing such important services as preparation of supplementary fodder, medication for livestock, transportation and marketing, and management of production and price risks. Finally, the gap between rich and poor herders increased dramatically.

Furthermore, Mongolia has been affected with three consecutive hard winters, leaving thousands of herding families with no animals and adding significantly to the ranks of the rural poor and destitute. There has been a surge of aid to affected areas, including provision of hay to save remaining animals and restocking of herders who are left with no livestock. This is not sustainable.

The project

In 2000, the Center for Policy Research (CPR) hosted an international seminar, which was attended by top officials of UNDP missions in Asian countries. A proposal was subsequently prepared to launch a small pilot project registering informal grazing rights of customary herding communities. The resulting project attempted to assist herders in adopting more sustainable strategies of income generation; namely, building capacities to mitigate risks, improving productivity, and introducing

¹ Center for Policy Research, Ulaanbaatar, Mongolia

alternative business opportunities. The objective was to change the incentive structure so that herders no longer maximise livestock numbers. The project used a holistic approach, with maximum participation of the direct beneficiaries in designing and implementing activities. This approach was deemed appropriate because different problems faced by herders are closely interrelated, and no one problem can be fully resolved without addressing other problems. For example, improving the supply of technological inputs, such as supplementary fodder and veterinary services, could not be achieved without improving marketing to increase herders' incomes. To ensure long-term continuity of activities started, the project tried to maximise community efforts.

There were seven aspects on which the project concentrated. They were institution-building and strengthening of customary herding communities, grazing land management, supplementary fodder, veterinary services, livestock breeding, marketing and small to medium sized enterprise (SME) development, and herder business skills.

Conclusions

The project had many good aspects. These included the participatory holistic approach, some unique ideas, successful cooperation with central and local government agencies, replicability and sustainability of some models and initiatives, and strong public relations activities.

There were also some debatable issues. The largest of these was the revolving funds provided by the project for the communities. There have been criticisms that these funds may not be sustainable. The project, however, deemed them to be sustainable for two reasons. 1) Under the scheme used, the funds were partly grants between the project and recipient communities; however, between the communities and their members, they were not grants but loans. Also, 2) all funds and equipment were used in accordance with rules developed and approved by community members; as such, these rules have mandatory power.

There have also been claims that the funds were too large. Under this project, one community received a fund of US \$1,000. Replication of this fund to the total of roughly 9,000 communities would require nine million dollars. In comparison, the international community spent US \$25 million in relief assistance during the past two winters. Unlike the funds used in this project, that money was not used for building the capacities of herders.

One problem with the funds that the project does acknowledge is that they give a wrong incentive to establish or join community institutions. The argument can be made that this is acceptable, since the communities are really self-sustainable, and those who joined are still enjoying them. They constitute a big improvement towards building the capacities of herders and a shift from the current state of welfare. However, there is room for improving the effectiveness and efficiency of these funds.

pastoralists, Government, and Natural Resources in Iran: organisational Learning in the Forest and Range Organisation

Mohammed H. Emadi¹

Background

The geo-climatic characteristics of Iran make most of the country more suitable for pastoralism than for crop cultivation, particularly in the Zagros and Alborz mountains of the central plateau. History illustrates that 'pastoralist nomads' have been the main users of these resources since times probably preceding any settlement by sedentary peoples. The ability to sustain such a way of life over millennia suggests that, at least until relatively recently, the nomadic pastoralists of Iran were able to achieve some sort of ecological and economic 'balance' through long-time co-adaptation with their environment.

All of this has changed drastically in recent decades, and nomads are now held responsible for significant degradation of the rangelands over which they migrate with their livestock. Indeed, the situation has degenerated to such an extent that many consider the continued existence of these transient pastoralists and their traditional lifestyle severely threatened.

Conventional strategies for development have generally failed to respect, or even to identify, the complex inter-relationships between nomads and their environment. Therefore, past efforts to improve the natural resource status of Iranian rangelands – traditionally entailing technology transfer and centralised, top-down planning – have generally been considered unsuccessful. Natural resource degradation is increasingly the major concern in these nomadic areas and has not been addressed by resource redistribution, technology, or conservation strategies.

Thus, there have been calls for the adoption of holistic perspectives as a foundation for effective strategies for collaborative and sustainable improvements. Reflections on field experiences in Iran, including endeavours involving various organisations, support the claim that 'participatory action research' (PAR) is an appropriate approach in the search for more holistic, participatory strategies for the co-management of natural resources utilised by pastoralists in Iran.

The project

The underlying theme of this paper is that the limited nature of achievements in nomadic development and natural resource conservation stem from two facts about past policies. First, they have been based on reductionist viewpoints and analyses, which separate theory from practice and neglect the diversity, complexity, and recursiveness of the different dimensions of nomadic life. Second, these policies are developed based on government perceptions of the nature of the issues confronting nomads, rather than on concerns shared by the nomads themselves.

Starting in 1990 and continuing for seven years, a project attempted to apply holistic research to integrate 'action' and 'research' into the learning process. Three interrelated phases of this PAR project were planned and organised independently with various actors. The aim of the first phase of research was to explore the

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complexity and diversity of the current problematical situation. The question dealt with by this phase of ethnographic exploration was, "What do the nomads themselves perceive to be threats to their welfare and cohesion as a purposeful group of nomadic pastoralists?"

Critical reflections on this phase of the research by the researcher-as-participant/observer confirmed the following:

- that the perception of the current situation by the nomads is complex;
- that the nomads feel uneasy and vulnerable in their present situation;
- that there is no sign of improvement in future trends as seen by the nomads; and
- that there is a need for improvement in mutual understanding between government officials and nomads.

Outcomes

Reflection on the outcomes of the first phase of the research led to the submission that a more action-oriented or 'development-focused' approach would represent a potentially important innovation in a seemingly irresolvable situation. The second phase therefore aimed to assist nomads and various government agencies to understand each others' perspectives, and to go beyond the 'symptom' to find common issues and goals. This was accomplished through a combination of the following two approaches: the 'northern tradition' of AR, with its emphasis on organisational change through problem solving; and the 'southern tradition' of PAR, developed in the context of empowerment of 'disempowered communities' in the 'third world'. Among the outcomes of this phase were clear agreement within the action researching teams about the failure of their conventional approaches to the 'problems with the nomads', and the particular transformation of that worldview into one more accurately portrayed as the 'problems being faced by the nomads'.

Reflection on these outcomes showed that changes in the attitudes and beliefs of practitioners toward 'seeing things the other way around' are crucial. Therefore, the third phase was designed to facilitate organisational learning for change within government agencies, such as the Forest and Rangeland Department. A workshop for this department was conducted with three themes – systems thinking, fundamentals of experiential learning, and people's participation in natural resource co-management. The essential metaphor introduced during this event was the organisation as a learning system as distinct from a regulating system. Feedback from the participants in this workshop confirmed that there were significant transformations in thinking about the complex relationships between Iranian pastoralist nomads, the environments in which they live and work, the technologies they use, the government departments concerned with sustainable development, and the society at large. This has resulted in a fundamental shift in organisational behaviour within the Department and the restructuring of the Ministry of Agriculture to better support participatory development in nomadic areas.

In closing, past approaches to development activities must shift from conventional empiricism, with its linear logic and power relationships, to models endeavouring to establish systemic and mutual recognition and accommodation of change among 'clients' and the facilitating researcher.



Tenure and Management Arrangements for China's Grassland Resources: Fieldwork Findings and Legal and Policy Recommendations

Brian Schwarzwald¹, Zheng Baohua², Li Ping¹, Su Yufang², and Zhang Lichang²

Background

Since establishment of the People's Republic of China (PRC) in 1949, grassland tenure arrangements have paralleled those on arable land. The 1950-1955 land reform programme redistributed land of landlords and rich peasants to poorer, landless, or tenant farmers. Following the subsequent collectivisation programme, rural land underwent a period of approximately 20 years of collective ownership and use. Current tenure policies for grassland in China began in the early 1980s with establishment of a pastureland contracting system, which adopted the household as the primary grassland contracting unit. Under the PRC Grassland Law (1985), pastureland remains under the ownership of the state or collective unit and is contracted to households for long-term use. Related management policies envisioned that allocation to individual households be followed by assignment of carrying capacities and that a system of incentives and sanctions be introduced to enforce compliance with assessed stocking limits.

Several characteristics of China's grassland resources have an important bearing on tenure and management arrangements.

- Grassland covers nearly 40% of China.
- China's grasslands are primarily located in its northern and western provinces, with high poverty rates and ethnic minority populations relative to other provinces.
- China's grasslands are geographically and ecologically diverse – from alpine meadows on the Tibet-Qinghai Plateau at over 4,000 masl, through steppe and desert in arid regions like Xinjiang (with less than 150 mm of annual precipitation), to hilly grassland in sub-tropical Yunnan Province or the semi-arid Loess Plateau.
- It is estimated that 90% of China's grassland has been degraded to some degree, with 42% moderately or seriously degraded. Many officials and researchers consider land tenure and management arrangements significant contributing factors to this ongoing degradation. As a result, grassland tenure and management arrangements in China should strive to balance a number of often competing objectives, including poverty alleviation, environmental protection, and continuation of indigenous resource management strategies.

Worldwide, there are two main methods of grassland management, each of which varies among countries. Under the common property model, property is used in common by a self-regulated group. Early pastureland systems centred on this model, on which many areas of Africa and Asia continue to rely. Under a second approach, utilised in most western countries, grazing land is privately owned or leased from the government by individual ranchers, and regulation is conducted by government agencies. This paper explores some of the multiple variations of these broad management styles in examples from Mongolia, the United States, Canada, and Australia.

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The following five attributes have been identified that might make a certain piece of grassland more suitable for communal land tenure: low production per land unit; low frequency of use or dependability of yield; low possibility for improvement or intensification; large herding territories required; and large capital-investments required.

The present project

The Yunnan Center for Community Development Studies and the Rural Development Institute undertook a cooperative research project in 2001; in August-September of that year, researchers conducted 14 days of fieldwork in 13 villages. Village selection criteria included ethnic composition; composition and nature of land resources; presence of unique tenure arrangements; and importance of agriculture, forestry, and herding to the local economy. The research team used primarily rapid rural appraisal and participatory rural appraisal techniques during village interviews.

The results of this project include the following five general findings.

- Common property grassland resource management existed in all fieldwork villages.
- Both local officials and farmers expressed strong support for common property resource management on some or all of their community's grassland.
- Many cadres and farmers felt that common property grassland management arrangements have been equally or more successful than household contracting.
- Local cadres and farmers felt that property rights regimes for arable land and non-arable land must reflect the unique characteristics of these different resources.
- Additional field research is necessary to determine the range of grassland tenure arrangements currently employed in China, their ability to meet central and local policy objectives, and opportunities for community-based institutionalisation.

Grassland policy recommendations

During the study, farmers described three factors that greatly effect grassland tenure in the region. These include 1) cultural preferences for common property management; 2) inability of individuals to manage, or even assert rights to, grassland areas, due to the remoteness of alpine pastures and the vast expanses of land involved; and 3) prohibitive expense of demarcating and enclosing individual pastures. This list is not offered to suggest that national laws and policies should attempt to devise a formula for application of policy alternatives based solely upon these factors. Rather, we would like to suggest that appropriate policy responses to combinations of factors in specific localities can be developed within a broad framework established at the national level.

We have the following policy recommendations. Formulation of central government policies governing grassland tenure should permit a variety of common property management systems, as well as household management, in order to account for a broad range of factors not addressed in current laws and policies. Design principles useful in establishing efficient and sustainable common property resource management systems include the following.

- Balanced national policies
- Local authority systems

- Clear legal access rights to the resource
- Audits of land condition and community behaviour
- Participation in rule-making processes
- Rapid, low-cost dispute resolution
- Management tools including fines, sanctions, fees, and taxes
- Forthcoming laws addressing grassland tenure (such as the Property Law and the Rural Land Contracting Law) should explicitly allow for local tenure variations.



Nomad People Should be the Major Concern in Grassland Policy - Case Study from the Northeastern Tibetan Plateau, China

Yan Zhaoli¹, Wu Ning², and Camille Richard³

Background

In most pastoral areas, the key constraint is lack of water; on the north-eastern Tibetan plateau, the key constraint is extremely low winter temperatures. This area – administratively covering eastern Qinghai, south-western Gansu, and north-western Sichuan provinces – is the most productive area of the Tibetan plateau due to its climate and topography, and grazing of cold-tolerant livestock has been the dominant land use here for thousands of years. The average elevation of the north-eastern Tibetan plateau is 3,500-3,600m, whereas that of the entire plateau is over 4,000m. The Yellow River and some of its local branches meander through this large depression comprising the transition zone among the Tibetan plateau, the highly erosive Loess Plateau, and the eastern China monsoon forests, and create one of the largest and most biodiversity-rich high-altitude marshes in the world. This area provides ecosystem services of global importance. Its ecosystems are characterised by variety, sensitivity, and uncertain successional trends. Its vegetation is dominated by perennial grasses and sedges of sub-alpine meadow and marsh types, such as species of *Elymus*, *Festuca*, *Poa*, *Kobresia*, and *Carex*. Although this area is very productive, it is one of the most sparsely populated areas (with only 125,000 people on over one million hectares), as well as one of the poorest, remotest, and most marginalised regions of China.

The current project

The objectives of this project were

- to document and analyse grassland regulations,
- to identify policy-makers and people with influence,
- to determine how grassland laws are interpreted and implemented by these actors,
- to realise how nomadic people understand and are affected by regulations, and
- to help the various stakeholders negotiate solutions

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The project started with a diagnostic study on the pastoral production system using rapid rural appraisal (RRA). Policies and the management regime – and their strong influence on rangeland ecosystem sustainability – were the main focus. As stakeholders were identified, we increasingly included them in information gathering and planning exercises using participatory rural appraisal (PRA). We conducted training workshops, feedback meetings, and planning consultations. Simultaneously, we conducted studies on vegetation biomass and biodiversity, grazing effects, and carrying capacity.

Results and outcomes

We identified the following grassland regulations affecting the study area.

- Grassland Law of the People's Republic of China (1985) and implementing regulations at various levels, including new revision
- Grassland Fire Control Ordinance of the People's Republic of China (1993)
- Sichuan Province Formula for Grassland Lease (1995) and detailed regulations at the prefecture level
- Grassland protection and wildlife and nature reserve conservation regulations at state and administrative levels
- Autonomous Prefecture Temporary Formula for Grassland Use Payment and Overgrazing Compensation (2001)

Along with these regulations, there are several key institutions affecting grassland policy. They include legislative institutions, in which technical officials have strong impacts, such as the People's Representative Committee; government and party leadership at province, prefecture, and county levels (which frequently interpret laws disparately); research and consultation institutions, such as universities; implementing institutions, such as township government staff and grassland supervision stations under prefecture or county Animal Husbandry Bureaus (AHB); and grass-roots level institutions, such as village heads, religious leaders, and herders with rich grazing experience.

The main aims of Chinese grassland policies are grassland allocation and conservation. The goal of grassland allocation is to alleviate degradation and improve nomadic livelihoods. Under this system, most winter-spring pastures are allocated to individual households, whereas most summer-autumn pastures are allocated to household groups. However, compulsory allocation is not always equitable or flexible and has resulted in many unforeseen problems. Also, the newly proclaimed Autonomous Prefecture Grassland Use and Overgrazing Compensation regulations are hard to enforce.

We discovered many other challenges to grassland policy enforcement. Due to lack of understanding of both policy and the rangelands, grassland technicians and County AHB staff could not implement grassland policy in a flexible, ecologically sustainable manner. Township and village leaders, supposed to enforce policy, have little say in its implementation and do not always understand its aims. Policy modification is difficult. Regional development decisions are frequently not feasible or sustainable. Some policies, however, such as the Grassland Fire Control Ordinance of the People's Republic of China, are well implemented and followed, because the local people appreciate them.

Local nomads felt that the national grassland law is a logical, flexible, and adaptable framework and that appropriate regulations are required at county and township levels. They felt that investigation is needed – assisted by experienced nomads and experts – before decisions are made and that local people should be allowed to express their opinions about policies. Finally, they felt that they – who depend on rangelands and livestock for their livelihoods – should be compensated when asked to conserve the environment for global sustainability.

This project taught us four main lessons. 1) Negotiation among stakeholders is critical. 2) Policy implementers at county and lower levels should receive training courses in rangeland ecology and management and policy goals. 3) The livelihoods and indigenous knowledge of nomadic people should never be neglected by decision makers. 4) Papers should be published to increase the awareness of leaders and the public.

This project also accomplished several things. Project team members' self-reliance and understanding of the working area and the participatory approach were enhanced. Provincial technical officials and local leaders were also introduced to the participatory concept. And finally, we achieved capacity building of local people, especially poor families and students, and even negotiated some solutions, through participation.

5 The Working Group Sessions



This chapter summarises the outcomes of the five working groups conducted on days four and five of the workshop.

The first working group consisted of a presentation by Dr. Ahmed Sidahmed from the International Fund for Agricultural Development, which highlighted IFAD's Livestock and Rangeland Knowledgebase. Participants were then asked to evaluate the CD and offer constructive criticism for its improvement.

The second working group focused on the outcomes of the Agri-Karakorum project and used this research as the basis for evaluating the advantages and challenges of system research in agro-pastoral regions. Suggestions are made to help streamline such research in the future to make it more applicable to the Hindu Kush-Himalayan condition.

The third working group began with three presentations regarding conservation initiatives on the Tibetan plateau. Dawa Tsering from WWF-China presented their work in the Chang Tang and eastern Tibet. Ingela Flatin from the Norway Tibet Network presented results of wildlife research conducted by staff and students of the University of Tromsø, Norway, in the Chang Tang, and proposed follow-up conservation actions. Nandita Jain from The Mountain Institute highlighted the approaches and outcomes of the Peak Enterprise "One Yak Two Cranes" project in central Tibet. Participants then discussed major conservation issues and formulated broad strategies for project implementation on the Tibetan plateau.

The fourth group began with a presentation by Camille Richard and Tan Jingzheng which disclosed hypothetical models for rangeland tenure as a basis for collaborative management on the Tibetan plateau, using examples from research. The group then discussed these outcomes and identified conditions that favour community-based management of rangeland resources in different regions of the HKH, South Asia and Central Asia.

The last group discussed the values and pitfalls of participatory development in pastoral regions, following up on the plenary presentation by Wolfgang Bayer on participatory monitoring and evaluation. The participants came up with a list of suggestions for when such approaches are valuable. In general it was agreed that this approach is key to success and should be incorporated into development plans whenever possible.

Working Group #1: Demonstration of IFAD's Livestock and Rangeland Knowledgebase

Located at International Cooperation and Training Center, TAAAS

Group Leader: Ahmed Sidahmed¹

Presentation of IFAD's Livestock and Rangeland Knowledgebase (LRKB)

Ahmed Sidahmed¹

This CD-ROM and the web site it parallels represent the first stage in IFAD's initiative to make available to the development community all of its accumulated experience in pursuing options for society's poorest. To date, 26 IFAD projects have been included in the Knowledgebase, but within a few months, this will increase to 50. Thereafter, the site will continue to develop until all of IFAD's experience enters the public domain.

Project information is accessible through the following headings.

Themes

These are broad headings that provide the most convenient entry point for most readers. Each theme is sub-divided into a number of Activities.

Projects

These represent another starting point for the reader. They are arranged by geographical region and can be accessed either from a list or through a geographical interface.

One of the most innovative and courageous parts of the Knowledgebase is its inclusion for each project of a section titled Lessons Learned. Within these sections, IFAD staff are quite candid about the successes, limitations, and difficulties of each project. This provides a clear set of footsteps for others to follow or eschew.

Articles on the disk are cross-referenced with hyperlinks to allow the user to follow a chosen theme. If the computer is connected to the Internet, these cross-links can lead to other related web sites. In addition, there are links from the Home Page both to other areas of IFAD's web site (www.ifad.org) and to the sites of related organisations.

The site contains a glossary, which will be particularly useful to those not completely familiar with all of the specific current vocabulary in the world of development workers.

¹ IFAD, Rome, Italy

Working Group Exercise: evaluation of the LRKB

Process

A working group was formed of workshop participants to individually evaluate the disk and its usefulness. Evaluation sheets were completed, and from these, a general impression emerged. Working group participants worked to envision ways in which the Knowledgebase could assist them.

Outcomes

Reaction to the disk, to its underlying philosophy and the way in which it was compiled, was extremely appreciative. There was a general feeling of gratitude toward IFAD for all its efforts to provide a powerful tool for development workers in many related fields.

As requested, working groups produced a series of suggestions as to how the Knowledgebase could provide more information and ways in which it might be made more 'user friendly'. These suggestions formed the basis for a series of constructive criticisms and recommendations to be presented during the plenary session of the workshop.

Comments from the evaluation

Contents

- The themes are not self-explanatory.
- Some activities are beyond the scope of the themes.
- Themes and activities may need reorganisation.
- A new theme of 'credit support' should be considered.
- More cross-referencing to sectoral themes should be considered.
- The overall treatment of 'lessons learned' was uneven.
- 'Lessons learned' should be stronger on positive, as well as negative, lessons.

Technical aspects

- A powerful search engine is needed for the disk and the site.
- The glossary should be available at all times as a 'pop-up'.
- Updates should be freely available as either further CD-ROMs or downloads.

Further information on IFAD's Livestock and Rangeland Knowledgebase can be found at www.ifad.org.

Working Group #2: What Can We Learn from a Systems Research Approach to Integrated Mountain Development?

Group Leader: Iain Wright¹

Facilitator: Iain Gordon¹

Process

The working group members were asked to answer two questions, around which a facilitated discussion ensued. These questions were:

- 1) How can the outcomes of the project best be implemented and what further research be conducted?
- 2) What is the value of a systems research approach for integrated development in agro-pastoral regions?

The questions were posed in relation to recommendations made by the Agri-Karakoram Project, which are summarised in the first four summarised papers in Chapter 2 of this volume.

Outcomes

Recommended actions for follow-up of the Agri-Karakoram Project

The group came up with the following issues and recommendations regarding how the outcomes of the project could best be implemented and what further research would be required.

Recommendations of the Agri-Karakoram Project	Comments by Group Members
Increase winter fodder availability	Agreement. Already being implemented, although financing is a limitation. Need to consider implications for rangeland degradation.
Pastures – shift timing of use	Some disagreement. Some feel that “the farmers know best”. Other issues may dictate timing, such as season of cropping or marketing, and need to be considered when making recommendations.
Pastures – increase use of winter <i>Artemisia</i> rangeland types	General agreement, but concern about short time-scale of data. Also, there is danger of overuse, requiring a fine balance. Distribution of animals needs to be researched.
Reduce animal numbers	General agreement, but already happening. Animals have multiple purposes. Can't dictate on this – should deal with cause rather than effect.
Marketing	General agreement. Good potential due to well-organised communities. Provision of market information should be emphasised. Need for more research on current status of animal trade. Need to define role of government, NGOs, communities in implementation of marketing strategies. The issue of pricing structure was raised and whether it should be based on livestock number or individual animal quality.

¹ MLURI, Aberdeen, Scotland, UK

Overall, the working group members agreed that government and NGOs in the Northern Areas are effectively helping farmers with grain, fruit, horticulture, and cash crop improvements, but also that the livestock/pasture system has been neglected. Therefore, the project needs to refine its recommendations to give specific action points that allow government and NGOs to carry them forward. This must happen before finances can be allocated for proposed recommendations.

Advantages and disadvantages of a systems approach to agro-pastoral research

Group members gave the following responses when asked to identify the values of a systems research approach to integrated mountain development in agro-pastoral areas.

Advantages	Disadvantages
<ul style="list-style-type: none"> • Better understanding of components and linkages • More objective information • Repeatable methods • Testable 	<ul style="list-style-type: none"> • High Cost • Time-consuming • Broader applicability beyond site specific locations questioned

Major points summarising the discussion

- A systems approach should include wildlife issues, which have tended to be ignored in livestock research.
- A systems approach should incorporate both indigenous knowledge and scientific approaches. This has been a problem in previous work.
- A systems approach is not restricted to scientific research methods but also prominent in rapid rural appraisal (RRA) or participatory rural appraisal (PRA) approaches.
- Donors compartmentalise funding into development and research. This leads to a lack of integration and lack of research in many development projects.
- A systems approach helps to minimise conflicting messages from different actors.
- Faced with immediate poverty issues, research becomes a cost that is left out. Development agencies are under pressure to show results quickly, while systems research is too long-term. Need to consider involving other players to conduct research for the long-term.
- Institutional memory is short, and there is a need to build on the findings of research rather than continually reinventing the wheel.

Working Group #3: Rangeland Conservation on the Tibetan Plateau

Group Leader: Ganesan Balachander¹

Facilitator and Translator: Li Bo²

Conservation in the Chang Tang - WWF's Conservation Activities

Dawa Tsering³

Background information

The Chang Tang is a vast area of mountains and high desert steppe covering over half of the Tibet Autonomous Region (TAR). According to traditional understanding, the Chang Tang includes the northern areas of Shigatse, eastern Ngari, and western Naqchu prefectures, but its boundaries are unclear. Despite the harsh conditions of the region, thousands of Tibetan nomads have lived there in harmony with nature for centuries, using their indigenous knowledge to make a living from the available natural resources. However, this balance is currently being threatened by increasing human population, development activities, illegal hunting, destructive mining, and construction projects.

The Chang Tang National Nature Reserve (CTNR), established in 1988 and since upgraded to national reserve status in 1993, is located in the northern part of Tibet and is the highest and second largest nature reserve in the world. This largely intact region is home to many rare and endemic wildlife species; including wild yak, Tibetan antelope (chiru), and snow leopard. Shenzha Nature Reserve (SNR) is located just south of CTNR and was established in 1993 with particular focus on the black-necked crane and its summer habitat – wetlands and alpine grasslands. SNR is also home to numerous other species of wildlife. Over 16,000 local nomads and their livestock live in this 40,000 sq.km reserve. Key features shared by these two reserves are geographical representativeness, intactness, biological diversity, rarity, and fragility.

WWF activities, achievements, and challenges

Since 1998, the Worldwide Fund for Nature (WWF) has collaborated with the TAR government and its offices relevant to conservation activities in the Tibet Steppe Ecoregion. WWF's Tibet Programme aims to develop an effective natural resource management system for biodiversity conservation and sustainable development in the region. It also seeks to cultivate harmony between human needs and natural resources by conserving TAR's unique ecosystems and rich biodiversity. Activities of WWF in the region have focused on a few main goals – building basic reserve management and anti-poaching capacities, strengthening communication and publicity, constructing a better nature reserve information and data system, understanding the current situation, and developing future action plans.

The WWF programme has had several notable achievements. It has helped government and local organisations control wildlife poaching more effectively by providing transportation and communication equipment to those working on wildlife

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monitoring and anti-poaching in the field. It has improved the skills of regional and local wildlife conservation staff in areas such as reserve management, GIS, and wildlife monitoring. It has raised conservation awareness in TAR through strategic communication in Tibetan, Chinese, and English. And, it has helped reduce illegal hunting of Tibetan antelope and trade in its fine hair, called 'shahtoosh', through support for anti-poaching work, international cooperation on trade enforcement, and increased public awareness in countries where demand for shahtoosh is high.

The programme has also experienced some challenges. Among these are general lack of conservation awareness among local people, including some government officials; continuation of market demand for illegal wildlife products, particularly shahtoosh; growing human and livestock populations and resulting pressure on natural resources; and difficult transportation and communication conditions.

During the next few years, WWF plans to strengthen their work in the Chang Tang region by deepening their understanding of key conservation issues, strengthening local conservation organisations, building partnerships, and developing community-based activities. Planned future activities include research, capacity building, strengthening management of natural resources and nature reserves, communication and awareness, and policy advocacy.

Recommendations

WWF has developed recommendations pertaining to several aspects of development. They include improvement of reserve organisation, personnel, and equipment; determination of solutions for conflicts among local residents over grassland and wildlife issues (including brown bear issues, grassland damage, and degeneration of livestock due to resource degradation); improvement of public awareness and communication; encouragement of collaboration; and support of policy. The latter – as the principle and foundation of action – can have tremendous positive or negative impacts on conservation. Policy development and practice must take conservation into consideration.

Public awareness and communication is another especially important component of conservation programmes. Public awareness, communication, and conservation education systems must be established or reinforced; in the next few years, communication systems, information, and methods should be developed. Current communications and publicity methods are simple and repetitive. It is necessary to develop new methods and to adopt suitable international experiences. The content of current communications and publicity is not only superficial, but also limited to information on conservation laws and regulations. This must be remedied.

Lastly, health and education are two major issues in the Chang Tang on which collaboration is required. Due to size of land area and difficulty of transportation, it is difficult for local governments to deliver certain social services at the village level. They should thus form joint projects with non-government organisations to improve health and education in the region. Among the most important topics for these project would be family planning, primary education, and skills training.



Pastoralism and Wildlife Conservation In the Chang Tang Nature Preserve

Joseph L. Fox¹, Drolma Yangzom², and Ingela Flatin³

Background

The ca. 300,000 sq.km Chang Tang Nature Reserve (CTNR) – a nomadic pastoralist area of the north-western Tibetan plateau and the world's second largest protected area – was established in 1993 by the Tibet Autonomous Region (TAR), China to protect endangered Tibetan antelope (chiru), wild yak, and other steppe and alpine species. The chiru population in particular has been decimated by hunting to fulfil a rapid increase in international demand for its fine wool (shahtoosh). In late 1997, leaders of TAR visited Europe and extended a request for international assistance to address conservation issues and develop suitable management and development initiatives for this large nature reserve. Norway responded to this request with an initiative through the University of Tromsø for baseline research in ecology and social anthropology, to lead later to development initiatives, with support from the Network for University Co-operation Tibet – Norway (Fox et al. 2004).

The remote 2,200 sq.km Aru basin in the north-western portion of the reserve, reportedly one of the best areas for wildlife in the entire reserve (Schaller and Gu 1994), was selected as the primary study site to investigate the interaction between wildlife and pastoralism. This basin, at about 5,000 masl, is home to nomadic pastoralists at the northern limit of inhabitation in the Chang Tang. Nomad communities use grazing areas in the Aru basin for sheep, goats, and yaks – some on a year-round basis, others only seasonally.

To date, field research has included four 2-6 week excursions within and around the basin during the years 2000 to 2002. Large mammal population estimates, distribution in relation to livestock, and initial habitat mapping and vegetation characterisation have begun. Information on pastoralist activities and livelihood decision-making criteria has been gathered primarily through informal interviews with all households present in the basin and in-depth interviews with a subset of nomadic households. Interviews with local leaders and TAR Forestry Bureau (TARFB) officials have also been conducted (Næss et al. in press). In addition to the TARFB partnership, fieldwork has also been in cooperation with the Tibet University Biology Department, Tibet Academy of Social Sciences, and Tibet Agriculture and Animal Husbandry College.

Wildlife conservation and nomadic pastoralism in the north-western Chang Tang

Populations of large mammals present in the Aru basin appear to be similar to initial estimates made about 10 years ago by Schaller and Gu (1994), except in the case of chiru and wild yak. Although the overall population of chiru in the western Chang Tang is still substantial, it is clear, in contrast to reports by Schaller and Gu, that parts of the Aru basin itself comprise an important component of the chiru migratory route. Counts of chiru in the basin numbered ca. 1,500 males in summer,

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which is similar to earlier reports, but over 10,000 males and females were present in autumn, much more than that suggested by these authors. Wild yak in the Aru basin have apparently decreased in number from over 600 in 1990 (Schaller and Gu 1994) to less than 100 today. However, populations of Tibetan gazelle, Tibetan wild ass, blue sheep, and Tibetan argali appear to be similar to earlier estimates. Wolves are common in the basin, brown bears are present, and a few snow leopards occur in the mountains. These predators are considered pests by the nomads and are still hunted to some extent.

Following a 15-year absence, nomads returned to the Aru basin in the late 1980s and began permanent year-round use in 1991, with livelihoods based on a combination of pastoralism and hunting for meat and trade. In the meantime, local dependence on a more modern surplus-oriented system increased as the international cashmere and shahtoosh markets rapidly expanded. Many nomad families, especially those in the northern areas of habitation, made a substantial income from hunting. With prohibition of chiru hunting in full force by 1995 and recent confiscation of firearms, many of these northern nomads today feel that they are not able to maintain a good livelihood. Without hunting, and especially without the shahtoosh trade, they have few alternatives for maintaining desired living standards.

Although large-scale organised poaching of chiru is currently a major problem elsewhere, it has not yet become so in and around the Aru basin. Nevertheless, the decreasing chiru population throughout its distribution has made the few remaining chiru strongholds, such as the Aru basin and its vicinity, critical to conservation efforts. Resident Aru basin nomads do not appreciate this conservation imperative and simply feel discriminated against because the chiru are still abundant around them.

The apparent 75% reduction in wild yak numbers in the Aru basin over the past decade highlights the issue of their conservation and must be addressed. Wild yaks no longer use the Aru basin lowlands as they did a decade or more ago, and their apparent susceptibility to human disturbance requires close attention, especially in and around core areas of the reserve designed for their protection.

The pastoral development programmes to increase livestock production efficiency based on total forage availability that are currently prevalent in the eastern Tibetan plateau are not compatible with maintaining populations of wild ungulates, other herbivores, and their predators, which require lower livestock densities for effective conservation. Increases in human and livestock populations, as illustrated in the Aru basin, are problematic; such issues with their concomitant pastoral livelihood imperatives must be addressed in and around wildlife reserve core areas. Also, the poisoning of 'pest' rodents and pikas prevalent in other parts of the plateau are not appropriate within a nature preserve, especially given the potential ecological importance of the pika in maintaining biodiversity values.

Conservation – development actions

Changes in government policy at various levels, cash income swings associated with the shahtoosh trade, volatility in cashmere prices, and changing societal demands for the education of children have forced nomads to re-evaluate their livelihood strategies much more frequently than in the past. Such need for flexibility is inherent in

nomadic life, but in recent decades decisions about trade-offs have become much more complicated and difficult to calculate and anticipate. New outside-initiated livestock development and nature conservation initiatives have introduced concepts with which the nomads are unfamiliar. Hunting bans and other restrictions, without proper explanation and compensatory action, only serve to antagonise reserve residents. Therefore, if the protection of wildlife is to become a primary management goal in some reserve locations and one of several goals in others, provision of stable livelihoods for pastoralist communities throughout the reserve will be critical.

What development actions, then, are appropriate where wildlife conservation is a major goal? CTNR is an immense area to be devoted to nature conservation. If this reserve is to be successful, immediate wildlife conservation measures are required that are designed to recognise the livelihood and development needs of local nomads. Clearly, a careful designation of priority areas for wildlife is required, wherein natural biodiversity protection is the highest management priority, with substantial portions of the reserve designated to accommodate livelihood enhancement compatible with conservation. Alternatives to the common livestock development models used elsewhere on the plateau, such as fencing, winter forage development, and pika eradication, must be researched and subject to experimentation; the proper choice of these will be critical to maintaining a workable balance between pastoralism and wildlife conservation.

With such goals in mind, high-priority conservation initiatives include efforts to accomplish the following.

Wildlife conservation and management

- Designate high priority wildlife management zones to protect important habitat
- Prevent organised outside poaching
- Evaluate where limits to livestock use within core areas such as the Aru basin might be placed; this would require maintaining sufficient grazing access for wild ungulates, including limiting disturbance to the remaining wild yaks caused by resident nomad communities

Livelihood enhancement

- Provide special livelihood enhancement opportunities, such as livestock product processing and marketing, to those reserve residents most affected by the hunting ban; this will require special micro-financing options that match local realities, combined with reciprocal agreements to limit livestock numbers in exchange for capital
- Conduct feasibility studies for the potential for eco-tourism in areas adjacent to key wildlife management areas
- If potential exists for eco-tourism, solicit government investment in eco-tourism and marketing infrastructure for these, but only where wildlife numbers are significant enough to attract visitors
- Improve social services (health and education) to communities residing in and near the reserve, with special conservation focused programmes offered to those most impacted by the hunting ban and adjacent to core wildlife areas
- Limit livestock losses due to weather and predation with such techniques as corral improvements, improved winter forage, and better veterinary care, but these actions must be coupled with improved marketing opportunities that

increase off-take of animals prior to the lean winter period; this integration will help to increase cash income and limit livestock densities, especially in areas adjacent to priority wildlife management zones

- Promote livestock mobility as a viable alternative to large-scale fencing, which can be detrimental to migrating yak and chiru; this will help disperse livestock herds and maintain rangeland forage for wild ungulates, however, it requires substantially more labour for herding and guarding
- Only promote fencing in non-core areas for the development of small-scale winter forage

Institutional strengthening

- Provide training in reserve management and wildlife monitoring to reserve staff
- Enhance reserve co-management efforts initiated by TARFB, including capacity building measures to improve management planning and implementation
- Train resident nomads in environmental education and reserve management and hire as reserve staff

These initiatives require enhanced reserve management and development programme implementation capabilities, and improved cooperation with reserve residents. Some can be addressed with pastoral development actions used elsewhere in TAR. Others will require additional research to address pasture productivity and allocation issues, in conjunction with close coordination with other government sectors regarding management follow-up. Improved education for residents of the reserve, from basic education to training appropriate for hire as reserve staff, can enhance all aspects of a conservation programme.

The TAR Forestry Bureau (TARFB) and WWF-China (Lhasa office) have already begun collaboration to develop a co-management system for the reserve. The TARFB, in co-operation with the University of Tromsø and WWF-China (Lhasa office), has applied for additional support from the Norwegian government to initiate some of these conservation initiatives, while incorporating a continued research agenda to inform the process. Co-operation with other governmental departments and international NGOs operating in the region is also a priority, so as to ensure the implementation of activities appropriate to conservation goals. Protection of the Chang Tang's environment lies in the balance, and we hope to see initiation of some of the above actions under this programme in the near future.

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One Yak, Two Cranes Project, Tibet Peak Enterprise Programme, TMI

Nandita Jain¹

Developed in late 1996, the The Mountain Institute's (TMI) Tibet-Peak Enterprise Programme supports the responsible creation and growth of Tibetan business enterprises by providing access to capital, training, and technical assistance. Working in partnership with the Federation of Industry and Commerce of the Tibet Autonomous Region of China, this new programme is developing local capacity to support the small but growing, private sector as an engine for indigenous development. The Peak Enterprise Programme is developing a model for a loan programme with associated business services, which incorporates environmental and social concerns. Once established, it will be a self-supporting financial and business services programme which will enable the local people to improve the quality of their lives and environment.

Objectives of the One Yak Two Cranes project are:

- to increase the incomes of local livestock farmers,
- to build entrepreneurship capacity in the dairy sector,
- and to contribute to conservation of the black-necked crane.

Issues identified during project planning phases included improving milk production methods, cultivation practices, and impacts on crane habits and habitat.

Results of project implementation included an increase in irrigation of fallow and winter wheat and establishment of conservation education measures. There has been no change in crane numbers as a result of intervention, but the project is still young.

Working Group Exercise: Identifying Issues and Strategies Regarding Conservation on the Tibetan Plateau

Process

After the three ongoing projects in Tibet had been presented, there was a group discussion and summary of outcomes. For the working group exercise, participants were presented with the following three requests.

- To identify the key issues and gaps in rangeland conservation and management
- To Prioritise these issues and gaps based on urgency, importance, and feasibility
- To propose key strategies for the above issues (broad groups of activities and actions)

Outcomes

The following extensive list of issues, broken into topical groups, was created by the working group participants.

Lack of research on rangeland degradation and livestock-wildlife interactions

- Land erosion, peat turf collection for fuel source (Shigatse), pika impact
- Better use of summer pasture

¹ TMI, Franklin, WV, USA

- Carrying capacity of pastures
- Urbanisation – roads and population
- Mining activities in western TAR
- Kiang (wildlife) impact on pastures
- Livestock - wildlife dynamics within different ecosystems (pastoral and agro-pastoral)

Rangeland policies and laws

- 'Middle path' for rangeland conservation
- Giving value to wildlife locally, use of indigenous knowledge
- Current policy focus on productivity, not on conservation
- Unique vegetation of the plateau lacks funding appeal due to lack of cranes or pandas, or other endangered fauna
- Co-management – extending decision-making beyond government to local groups
- Contracting rangelands to rangeland users
- Giving locals authority to manage
- Regulations needed for non-locals to use rangeland resources

Livelihoods and development

- Fuel sources for communities
- Other livelihood options – e.g. tourism
- Hazard management
- Lack of markets

Institutional capacity to manage

- Agencies not fully established
- Many agencies – no specific rangeland focus
- Little local capacity to manage rangeland

From this list, priority issues were identified and strategies formulated to address them. The table below lists these issues and strategies.

The working group came up with more specific strategies and activities to address specific gaps in rangeland conservation and management.

For example, there is a gap between policy-makers' goals (protection) and the interests of local people. Development of alternative livelihoods can be a tool to address this gap. This can include capacity building, decentralisation, and improved two-way and horizontal communication.

To address the issue of rangeland carrying capacity and grazing impact, family planning should be initiated to control human population growth, and accurate livestock population numbers should be determined. Also, development of non-pastoral livelihoods can help bring rangeland use within carrying capacity. To monitor the success of these measures, a centrally coordinated grassland monitoring system should be established and comprehensive rangeland monitoring conducted.

To address the lack of capacity at various levels, existing capacities and resources should be identified; regular stakeholder meetings, workshops, trainings, and study

Issues	Strategies
Policies/laws	
Lack of conservation vision	Visioning the status of rangelands in the next decade. Striking a balance (the middle path) between conservation and development
Management	Integrated planning
No rangeland focus	Establish rangeland management units based on carrying capacity and conservation values
Insecure tenure	Contracting of grassland to households or groups of households
Cross-boundary land use and trade	Greater cooperation across borders; consistency in international laws; coordination and cooperation; building on traditional values; involvement of local people
Interdisciplinary research	
Ecological	Research coordination and cooperation at multi-stakeholder levels
Socioeconomic	
Improved and diversified livelihoods	
Markets	Marketing research and cooperative development
Income generation	Medicinal plants, milk, handicrafts, eco-tourism, regulated hunting; coordination and cooperation
Rangeland degradation	
Mining	Setting livestock numbers and controlling incentives; coordination and cooperation; greater investment in technical options
Overgrazing	
Invasive species	
Loss of biodiversity	
People-wildlife interactions	
Lack of awareness	Use participatory approaches at local levels to change perspectives at community, NGO and government levels
Reciprocity	Local communities must be the first beneficiaries through alternative income generating schemes such as eco-tourism
Government effectiveness in implementing conservation plans	
Lack of government coordination	Coordination and cooperation; development of co-management plans; authentic involvement of local people
Lack of management capacity	Training in participatory approaches, management skills

tours should be organised; and intergovernmental scholarships should be established. During this process, local knowledge should be appreciated and utilised. A Tibetan plateau web site would provide a valuable source of information for these activities.

To address the lack of collaboration between governments and other institutions, a committee should be formed based on this workshop. Further, more workshops like this should be held. Government involvement at the beginning of projects can help ensure their cooperation.

To address the lack of comprehensive and multi-disciplinary research, multi-stakeholder groups should be organised to conduct participatory research at the local and protected area levels.

To address the lack of awareness at various levels, face-to-face communication among levels is important. Also helpful would be television programmes in local languages and training for both policy-makers and local community members.

Working Group #4: Appropriate Institutional Arrangements and Policies for Community-based Rangeland Management

Group Leader: Tony Banks¹

Facilitator and Translator: Tan Jingzheng²

Resource Tenure Models for Rangeland Improvements

Camille Richard³ and Tan Jingzheng²

Background

Given the rapidly changing socioeconomic context in which pastoral communities find themselves, there is certainly a need for improved rangeland management to meet the growing demand for forage in an increasingly commercial livestock economy. However, rangeland improvement schemes rely on continued capital investment and maintenance by livestock owners, which is only possible with secure access to pasture, water, credit, and labour. Resource tenure thus becomes a fundamental aspect of effective rangeland management. Tenure is not merely ownership, as is commonly believed – it involves rights to control and access resources. Tenure can be legal or informal, public or private, common or individual. It involves those entities that make decisions and those that get the benefits from the resources, and thus implies a dynamic process of negotiation.

Eastern Tibetan plateau case study

Given the potential complexity of resource tenurial arrangements, the question is raised as to whether individual tenure and fencing is the sole answer for improving rangelands of the Tibetan plateau – heterogeneous in water and forage availability, naturally low in productivity, and home to a population still dependent on diverse subsistence livelihood strategies. In the mid-1980s, the government of China formulated the Grassland Law, based on the implementation of the Individual Household Responsibility System in agricultural areas, and has since been implementing it throughout western China. However, implementation is proving difficult on non-arable lands in remote, socially and environmentally marginal landscapes such as the Tibetan plateau.

The Chinese government felt that settlement and fencing could help provide reserve pastures during critical periods, such as winter storms, and thus decrease livestock losses. Problems with implementation of such standardised policies include spatial and temporal heterogeneity of pasture resources, lack of local input, and unsuitability of allocation in terms of fair distribution of resources to households. These factors become more pronounced as the environment becomes more marginal, rendering such policies ineffective at the local level.

Three broad scenarios of land allocation and management arrangements are present under current implementation of the Grassland Law: local autonomous control; strict enforcement of Individual Household Responsibility; and co-management (bringing

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together indigenous and scientific strategies and allowing for more flexible policy interpretations and adjustments). Brief discussions of these three simplified models are provided below, details are given in the full paper in Volume 2 of these proceedings.

Strict enforcement model – A pilot programme was established by the Sichuan Animal Husbandry Bureau in Hongyuan County, Sichuan Province, as a livestock and pasture development demonstration site. Here, families were encouraged to settle on individual allotments for year-round use and household management. The advantages of this approach have included reduced overall labour demand on households and increased survivability of herds in the winter. Disadvantages have included prohibitive fencing costs per household, restricted access to water sources, reduced access to schooling for children, increasing conflicts due to poor pasture allocation, a widening gender gap, and dramatic impacts on herd distribution. The latter is due to Hongyuan County's designation as a milk producing area, which causes families to keep their lactating herds near the road and milk collection sites, leading to severe overgrazing of these areas.

Co-management model – In Maqu County, south-western Gansu Province, many families have also been legally allocated individual winter pastures and manage at an individual level. However, this county has also allowed groups of up to ten households to pool their pastures and fence the outer boundary. The number of livestock that each household can graze is calculated primarily based on the number of people in the household. Households that own fewer livestock than the number they are entitled to graze are compensated by households that own more. The benefits of this system have included lower fencing costs, economies of size with respect to herding, and equitability (poor households are guaranteed access to and compensation for forage equivalent to that produced by their share of pasture). Because Maqu County was declared a meat and butter-producing zone, herds are more evenly distributed across the landscape than those in Hongyuan County, as meat and butter are more durable than milk and do not require livestock concentration near product collection points.

Another example of co-management is in Nagchu County in the northern Tibet Autonomous Region (TAR), where resource rights are legally appropriated by villages, and management is collective. Here, the government has contracted fattening pastures to villages, feedlot locations were selected through consultation with communities, and fences were constructed where appropriate. Rules for use of collective pastures are set by village governments and address household labour contribution and number of livestock per household. Households in Nagchu may choose to take individual winter allotments or to combine land access rights.

Local autonomous control model – The vast majority of pastoral communities on the Tibetan plateau still access their pastures with legal rights given to administrative villages but not officially contracted under current law. Most communities within these administrative villages have chosen to retain autonomous control and have set their own rules for pasture access and management, using 'social fencing', or collective herding and border patrol, as means to enforce boundaries. Some county governments, such as Maqu, refuse to provide government subsidies to such groups if they fail to allocate grasslands according to policy. The advantage to this approach is that fencing costs are nil. Disadvantages include higher labour requirements and greater potential for encroachment by outside communities without effective legal recourse.

Conclusions

The above examples show that when communities are given the choice, they often choose collective arrangements, which are more affordable and in keeping with customary practice. Even in cases where allotments have legally been granted, actual use and management practice follows a more customary pattern of group tenure and management. Herders will continue to engage in common property arrangements until the socioeconomic environment is such that household members can engage in alternative forms of livelihood, and those remaining can access capital and pasture sufficient to maintain economically viable herds.

Recent revisions of pasture allocation legislation in China allow flexibility in interpretation. The newly revised Rural Land Contracting Law allows for some degree of collective tenure and management, such as contracting to groups of herding households, giving households the security to access resources, while allowing them to engage in collective management arrangements. As long as future policy guidelines retain this flexibility, arrangements may range from individual household contracts where land is individually managed to large-scale collective arrangements for protection and management of landscape amenities.

Working Group Exercise: Defining An Enabling Environment for Co-management Arrangements

Process

The working group was divided into two groups based on regional interest: South Asia (India, Nepal and Pakistan) and Central Asia-Tibetan plateau (Mongolia and China). A series of questions were posed to each group, which they were to answer and present back to the larger group later in the session. The combined questions and outcomes of these two sub-groups were then presented in the plenary session at the end of the Lhasa workshop.

Outcomes

The outcomes are summarised below.

1. When we say 'community-based management', what does 'community' mean?
 - Community groups can be joined by kinship or religion
 - They are groups using/managing the same grazing/water resource
 - They can be village based or tribe based
2. What would be the ideal 'community' (in terms of size, kinship, ethnicity, wealth, etc.) to manage a rangeland area in your particular region (within an administrative area)?
 - There is no ideal size - it depends on the specific socioeconomic or ecological setting.
 - It would sometimes be based on kinship, sometimes not.
 - It needs flexible kinship/ethnicity links.
 - Members have shared interests.

- Resources are equitably distributed and accessible.
 - It has ethnic homogeneity but good relations with other groups.
 - It should have a political voice.
 - It should have decision-making rights.
3. What skills (both individual and organisational) would these communities need to effectively manage rangeland resources if working under a co-management arrangement?
- good leadership (literacy, experience, etc.) that can link the community with state governmental bodies
 - social structures and mechanisms that favour decision-making and responsible actions
 - shared norms (informal) and formal legal rights
 - capacity to adapt to changing environments
 - good understanding of the resource base
 - good community decision-making skills
 - ability to resolve conflicts within the community
 - ability to assess their own needs
 - knowledge of markets and entrepreneurship
 - negotiation skills with government, NGOs, other communities
 - indigenous and other technical knowledge
4. What are the skills necessary for the organisations that are mandated to work with these communities, particularly the field staff?
- understanding of multi-sectoral aspects of pastoral areas
 - knowledge of the area and people (must be culture and gender sensitive)
 - skills in participatory planning and implementation (ability to listen and learn)
 - respect for local knowledge about rangeland resources
 - change working approach and attitude
 - skills to accommodate the under-privileged
 - skills to resolve local disputes
 - advocacy skills
 - organisations must switch from top-down to bottom-up planning (with a mandate to serve rather than to dictate)
 - two-way interaction between staff and people is required
5. What type of external technical, financial, institutional and policy support is necessary to increase the capacities of communities and field staff to implement a co-management project?
- support for effective local assessments (needs, priorities, skills, capacity building)
 - mainstream assessment and planning process
 - tenure and decentralisation policies must be clear at various levels

- legal recognition of various resource management user groups (primary and secondary) as mutually agreed
- better stakeholder involvement
- decentralisation of planning and implementation at community level
- external legal conflict resolution mechanisms
- appropriate education infrastructure
- advocacy networks to protect rights at national level

6. Regional differences (between Central Asia and South Asia)

- The role of kinship is not as important in Mongolia as in China – there is a more neighbourhood aspect to communities.
- ‘Community’ in the South Asian context is more diverse and tends to be more ‘closed’ (such as tribal communities in Pakistan).
- The South Asian group emphasised the role of education and government commitment to co-management to break the cycle of inequitable tribal decision-making (especially in the case of Pakistan).
- For more ‘open’ communities, the south Asian group prioritised legal rights and frameworks to support mutually agreed plans.

Working Group #5: Integrated Research and Extension Needs for Participatory Rangeland Management and Pastoral Development

Group Leader: Wolfgang Bayer¹

Facilitator and Translator: Li Bo²

Process

Presentation of issues related to participatory research and extension in pastoral regions (see Wolfgang Bayer summary in Chapter 3)

- 1) Facilitated discussion among the group regarding presentation
- 2) Summary of discussion presented in plenary

Discussion

Use of participatory approaches is very important in systems appraisal, and it is important that communities, non-government organisations (NGOs), and government share in these approaches. However, participation is not a panacea. There is much to be learned both from science and from indigenous knowledge. The following questions were raised and points addressed during this working group discussion.

Can participatory approaches be used in government to prevent different departments – such as the Animal Husbandry Bureau, Environmental Protection Bureau, and

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Rangeland Department – from having conflicting policies that farmers must follow? This problem is made worse by the fact that governments have little to do with management. Local people attempting to manage according to many disparate regulations become confused and frustrated.

There is a need for further in-depth research to address threats to pastoral systems. This research should be conducted in a participatory way.

Frequently, foreign consultants and local counterparts have different agendas and are not of similar standing. Also, continuity is difficult when consultants leave a project after a certain time period, such as one year. Two ways to address these problems are to ensure that the local counterpart is of similar seniority to the foreign consultant and to employ the local counterpart on the project full-time.

Participatory approaches are very good for small numbers of communities but are difficult to implement on a larger scale.

Farmers have short-term perspectives, whereas governments have longer views. One good way to reconcile these is to stimulate the interest of the community in the long-term sustainability of the grassland. This often involves tenure.

Although communities, foreign experts, and NGOs all play a role, the real decisions are made by politicians. How can we influence them?

Results of participatory evaluations affect future funding – this can influence the outcomes of such evaluations.

Rather than beneficiaries, local people involved in a participatory project should be seen as partners.

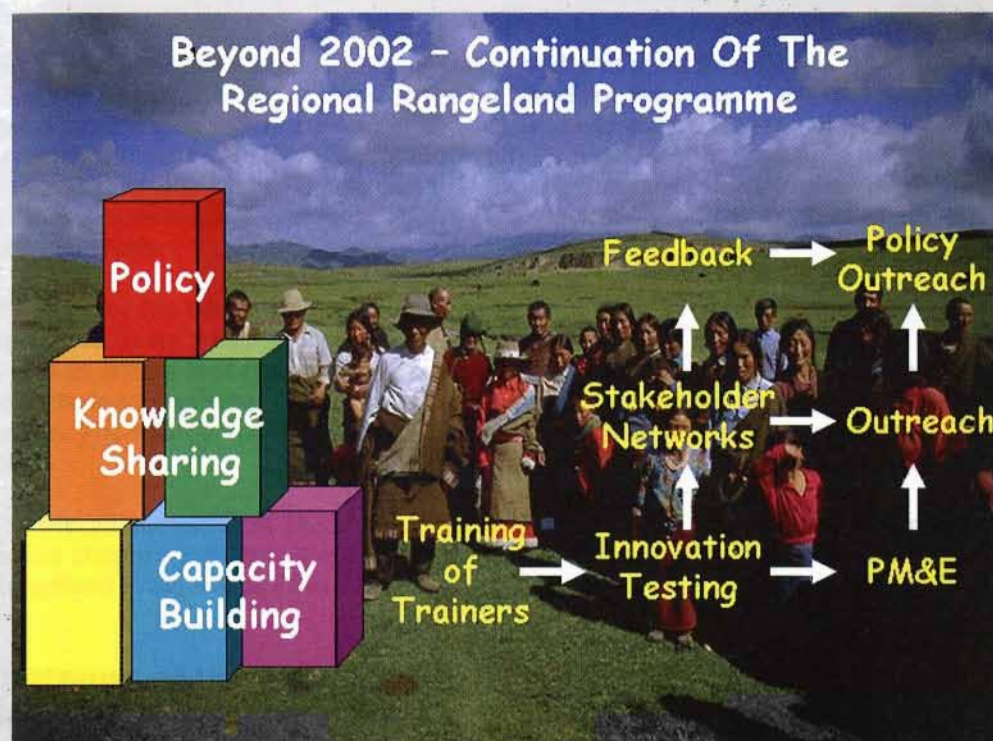
How should we continue activities begun by a project after the project is finished? (Most projects only last about five years.) Projects should work to prevent 'project dependency syndrome'. The State has a responsibility to continue necessary components of a project after the project is finished.

Summary of discussion on participatory development, research, and extension

- Nobody questioned the need and usefulness of participatory approaches.
- Government agencies need to be involved; otherwise, they may be reluctant to accept the results of participatory research and extension.
- Long-term development is clearly the responsibility of government, local, and community authorities.
- Foreign experts, funds, and interventions should act upon demand and give special contributions to responsible authorities.
- Political support for participatory approaches is essential.
- Participation in research must balance advanced scientific findings and rapidly disappearing indigenous knowledge.

6 Strategic Innovations for Improving Pastoral Livelihoods in the Highlands of the Hindu Kush-Himalayas

Beyond 2002 - Continuation Of The Regional Rangeland Programme



Cover photo: Powerpoint slide from Camille Richard's introductory presentation
(background photo Daniel J. Miller)

6

Strategic Innovations for Improving Pastoral Livelihoods in the Highlands of the Hindu Kush-Himalayas

The workshop identified a number of issues and emerging themes related to the situation of the pastoral peoples of the highlands of the Hindu Kush-Himalayas and the rangelands on which they depend. These were further discussed at a round table session held at the Bishkek Global Mountain Summit Meeting, the wrap-up meeting of IYM 2002, held in Bishkek, Kyrgyzstan, from 29 October to 1 November 2002. Based on these, a series of recommendations were made for action at local, national, and regional levels.

The plan for the next phase of ICIMOD's Regional Rangeland Programme was developed using these findings and the lessons learnt and experience from the first phase to ensure that it would have a relevant, useful, and feasible approach that will contribute to providing strategic innovations for improving pastoral livelihoods in the region. The main emphasis is on the further development of a 'co-management' focus.

The overall outcomes of the Lhasa Workshop and Bishkek Round Table are presented in this chapter, together with a detailed summary of the plans for ICIMOD's Regional Rangeland Programme Phase II.

Outcomes of the Lhasa Workshop and Bishkek Global Mountain Summit

In general the meeting in Lhasa offered participants a unique opportunity to engage in scholarly exchange, stakeholder dialogue, and strategy formulation to address the important questions asked. Outcomes included the following:

- a broader scope of knowledge among a diverse audience (community to policy level),
- establishment of linkages across a common ecological and cultural landscape (such as a cultural fair for Ladakh, Mustang, and Bhutan; trade in livestock genetic material across closed borders; Iran-Pakistan-Afghanistan linkages; and Central Asian linkages),
- research collaborations forming across borders and among international organisations,
- initiation of a juniper restoration forum within the Asia Pacific Mountain Network located at <http://www.mtnforum.org/apmn/juniper_forum.htm>, and
- formulation of plans for follow-up policy-level meetings in India, Pakistan, and China to address collaborative management issues for rangelands in the HKH.

The following issues and themes emerged from the various presentations and discussions during the workshop, augmented by the discussions conducted during the roundtable at the Bishkek Global Mountain Summit. General strategies and actions are recommended and presented in Table 1 (shown after the issues) as a follow-up to the emerging themes.

Issues and emerging themes

- Changes in land use in many areas are reducing access to pastures and curtailing pastoral livelihood options. However, many examples of traditional pastoral production practices exist that still prove to be sustainable in practice, although they face a number of new challenges in a changing global environment.
- Extension and other social services, where they exist in pastoral areas, are often weak and inadequate and force nomadic communities to settle rather than provide mobile services. This has caused severe disruption of both livelihood systems and ecology. Research and extension organisations require reorientation and capacity building in appropriate participatory tools and techniques in order to effectively deliver services determined by local needs and mobility rather than by government mandates.
- Participatory approaches are proving successful at a number of sites, but there are no national strategies to scale up these approaches in the region. Often, government policies and approaches undermine such grassroots efforts.
- Technologies to improve pasture and livestock production have not been properly matched with local environmental, economic, and cultural realities. This can be corrected through local participatory action research initiatives using indigenous knowledge as the basis for new innovations.
- Pastoral development must be extended beyond livestock and forage management. Technical and social service sectors must be integrated to address complex issues of natural resource management, risk management, and marketing.
- Pasture and rangeland tenure is poorly defined, and a large gap exists between legal status (usually government owned) and customary practice. Usually, common property characteristics are not reflected in law. Communities need secure tenure, but tenure policies must help reduce economic and environmental risk in a highly variable environment.
- Rural land tenure policies that promote private access to pasture resources are often not appropriate for rangeland areas. These areas require policies that allow site-specific flexibility in implementation to allow combinations of collective and private pasture tenure and management arrangements, depending on local skills, financial capital, and cultural backgrounds. This requires a more integrated collaborative management approach, in which governments share decision-making authority with relevant stakeholders.
- Where flexible policies exist, they appear to be poorly understood by the local-level authorities mandated to implement them. This results in misinterpretation and ineffective implementation.
- Remote mountain pastoral communities cannot compete with the industrial livestock production of the lowlands and urban areas. Niche markets (such as organic yak meat, yak and pashmina fibre, medicinal plants, and tourism) prove to be the best options for enhancing the cash income of remote pastoral households. These require policies that support proper livestock off-take, marketing, value addition, and risk management.

- There is a need for more effective communication channels among those who develop policy, development workers, and researchers. This can be achieved through strengthening of networks and collaborative efforts among diverse stakeholder groups.
- Geo-political conflicts and policies often undermine pastoral movement across borders. Trans-boundary agreements should be promoted that preserve trade and livelihood enhancement and allow cross-border movement of livestock to relieve grazing pressure on rangelands.
- Greater attention should be given to the impacts of globalisation on pastoral communities, especially in countries such as China that have entered into membership with the World Trade Organization (WTO). WTO instruments should favour niche production and marketing in mountain rangeland areas.
- Pastoral regions are often strategic sites for conservation, and any policy for their development should integrate conservation initiatives with livelihood enhancement. In many sites, eco-tourism is proving to be a viable approach, but it must be seen as only part of a larger pastoral economy. Efforts also need to be strengthened to improve conservation awareness and anti-poaching campaigns to protect endangered wildlife and plants.
- As the headwaters of major river systems, mountain rangelands provide important ecosystem services. Given their conservation significance, compensation mechanisms should be in place to preserve ecosystem functions and pay for the cost of ecosystem reconstruction in degraded areas.

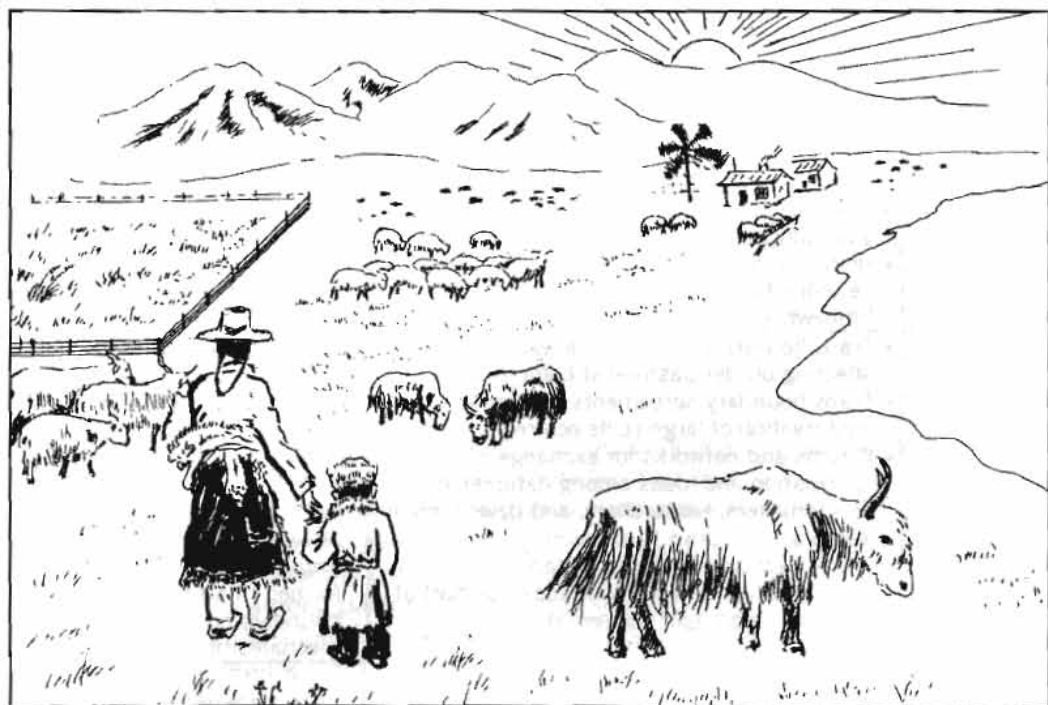


Illustration from 'The Living Plateau' (2001), editors Nico van Wageningen and Sa Wenjun, published by ICIMOD, a book about the EU funded Qinghai Livestock Development Project implemented by Qinghai Province's Bureau of Animal Husbandry

Table 1: Key actions recommended to be taken at various levels of governance

Level	Key actions	Support needed/actors
Local/ community	<ul style="list-style-type: none"> • Action research initiatives to test new institutional and technological innovations that address priority needs, diversify income, and are sustainable • Technical and managerial capacity building for local decision-makers and local extension staff • Established and functional information exchange mechanisms relevant to pastoral communities • Improved market access through linkage with the private sector • Improved social services at the local level through NGOs and line agencies 	<ul style="list-style-type: none"> • NGOs and line agencies able and willing to facilitate local participatory initiatives • Funding available for capacity and development works by national governments • Appropriate technologies and financial options provided by research and financial institutions to both households and user groups
National	<ul style="list-style-type: none"> • Integrated frameworks for rural development adapted to pastoral regions • Rural land contracting laws that favour tenurial flexibility for both household and common property arrangements (CPRs) • Policy instruments that support integration across government agencies through a cross-sectoral coordinating body • Restructuring and/or reorientation of line agencies in pastoral regions to address complex interdisciplinary issues • Restructuring of academic and technical curricula to instill participatory research skills • Greater national support for NGOs and advocacy networks • Highland-lowland compensation schemes developed as part of the larger mountain framework 	<ul style="list-style-type: none"> • The political will to support decentralised, flexible, and participatory frameworks and programmes • Funding support from governments and donors • Technical training and reorientation through action research for research and policy-level personnel in collaborative/interdisciplinary management • Formation of an interdisciplinary coordinating body for mountain regions
Regional	<ul style="list-style-type: none"> • Trans-boundary exchanges to address issues affecting border pastoralist communities • Trans-boundary agreements regarding conservation of large-scale eco-regions • Forums and networks for exchange of information and ideas among national-level policy-makers, researchers, and development workers • Trans-boundary highland-lowland compensation schemes developed as part of the larger mountain framework 	<ul style="list-style-type: none"> • Regional funds provided by participating governments • Matching funds by regional donors • Technical support and facilitation provided by regional research and advocacy organisations • Regional coordinating body formed to oversee trans-boundary compensation mechanisms

Beyond 2002 – ICIMOD's Regional Rangeland Programme Phase II: Further Development of a 'Co-management' Focus for Rangelands

Rationale, objectives and outcomes

Of growing importance in ICIMOD's work is the role of community-based institutions and the organisations that support them in the management of common pool resources. We propose to help strengthen these institutions through capacity building, knowledge generation, and policy advocacy in order to help pastoral communities and governments adjust to and take advantage of the regional and global opportunities that exist, finding solutions through partnership.

ICIMOD's mission for the RRP Phase II is to develop and support a process for community-based management of rangeland resources in the HKH, in cooperation with regional and international partners, which foster action and change for overcoming rangeland dependent mountain communities' economic, social, and physical vulnerability.

This will build on the experiences of the first phase of the RRP, especially considering the interdisciplinary nature of rangeland resources and their use. Our target group is the partner institutions who are mandated to work with pastoral communities and in rangeland conservation.

Short-term objectives

- 1) To strengthen the institutional capacity of partner institutions for collaborative rangeland management and pastoral development
- 2) To test, document, and promote ecologically appropriate, socially equitable, and gender sensitive innovations in rangeland management with a focus on vulnerable groups
- 3) To develop and support national and regional networks that promote free exchange of information pertinent to pastoral livelihoods, and provide these networks with the capacity to develop and support local community networking mechanisms
- 4) To identify and support policy strategies that support collaborative development processes in pastoral regions

Short-term outcomes

The specific programme components and activities supported under the RRP Phase II are expected to help achieve the following short-term outcomes.

- New and improved technical and institutional innovations identified and adopted that address complex rangeland management and pastoral development issues, incorporating biodiversity conservation values
- Increased skills among partner institutional staff working with pastoral people regarding multi-disciplinary, participatory approaches to rangeland management and pastoral development
- Increased capacity among various decision-making bodies to engage in collaborative management processes
- Increased participation in decision-making by vulnerable groups in pilot communities

- Improved organisational performance among partner institutions in delivering services and information to nomadic communities
- Improved networking among stakeholder groups at national and regional levels
- Improved capacity of partner institutions to develop and support local community networks and advocacy groups
- Policy implementation that accommodates and supports the complexity and flexibility needed for development and conservation in rangeland ecosystems, including effective tenure arrangements that favour collaborative management schemes

Overall, the implementation of our co-management strategy for the RRP will contribute to ICIMOD's strategic outcomes (ICIMOD's Strategic Plan 2003-7), which are as follow.

- Productive and sustainable community-based management of vulnerable mountain rangeland natural resources
- Greater voice and influence, dignity, security and social equality for rangeland dependent people
- Increased regional and local conservation of rangeland biological and pastoral cultural heritage
- Improved and diversified incomes for vulnerable rural and marginalised rangeland dependent people
- Decreased physical vulnerability within rangeland watersheds

Programme components and activities

ICIMOD proposes the following programme components to achieve the objectives stated above. These components are strongly inter-connected and meant to build upon one another, in the order presented. These components and yearly activities are presented in Table 2. Figure 1 illustrates how the components fit into ICIMOD's Strategic Plan.



Capacity Building

To build the capacity of partner institutions who are mandated to work in pastoral regions of the HKH to engage in a process of co-management of rangeland resources

Training of Trainers in Co-management of Rangelands – The first major activity is a Training of Trainers for the initiation of a co-management process (participatory assessment and planning). This will prepare trainees to train local extension staff and herders in basic participatory research techniques, using field-tested training modules developed during the RRP-I. Trainees will then train and conduct participatory trainings and assessments at the local level in selected pilot demonstration sites.

Follow-up Training of Trainers programmes are then provided to 1) maintain a co-management process (participatory monitoring and evaluation and organisational management), and 2) to disseminate a co-management approach (networking and advocacy). These training events directly support the subsequent programme components.

Table 2: Programme components, activities and yearly outputs for ICIMOD's RRP Phase II

Programme Components	Broad Activities		
	Year 1 (Apr 03 – Mar 04) <i>Co-Management Initiation</i>	Year 2 (Apr 04 – Mar 05) <i>Performance Management</i>	Year 3 (Apr 05 – Mar 06) <i>Dissemination of Co-Management Approach</i>
CAPACITY BUILDING 	Regional Training of Trainers in participatory assessment and planning for rangeland co-management Local pilot site training in participatory assessment and planning	Regional Training of Trainers in participatory monitoring and evaluation (PM&E) for rangeland co-management Plan for PM&E system developed for each pilot site	Regional Training of Trainers in networking and advocacy for rangeland co-management Local pilot site assessment to identify potential networks/cooperatives for institutional strengthening
KNOWLEDGE GENERATION AND SHARING 	Regional network and working groups established among direct partners (inception workshop) Pilot site planning and implementation	Pilot site PM&E system initiated Pilot site outcomes shared through regional network (internet based) Exchange visits	RRP regional partner forum to share outcomes of pilot site activities and prioritise next steps
POLICY ADVOCACY	Local policy forum at pilot sites to introduce project activities	Local level stakeholder forum to present outcomes of PM&E Policy advocacy strategy developed	Development of policy advocacy outreach materials based on outcomes from pilot sites Regional forum for national level policy makers (combined with partner forum)
Yearly Outputs	<ul style="list-style-type: none"> A cadre of trainers trained among partner institutions in participatory assessment and planning for collaborative rangeland management Pilot site demonstration plans developed, initiated and supported by local government Outreach materials developed from phase I for use in ToTs 	<ul style="list-style-type: none"> A cadre of trainers trained among partner institutions in participatory monitoring and evaluation techniques and organisational analysis PM&E system developed and tested at pilot sites Professional networks established through national and regional forums for sharing outcomes from pilot demonstration areas 	<ul style="list-style-type: none"> A cadre of trainers trained among partner institutions in community networking and policy advocacy strategies Policy implementation guidelines developed and promoted for each participating country to support collaborative management of rangeland ecosystems

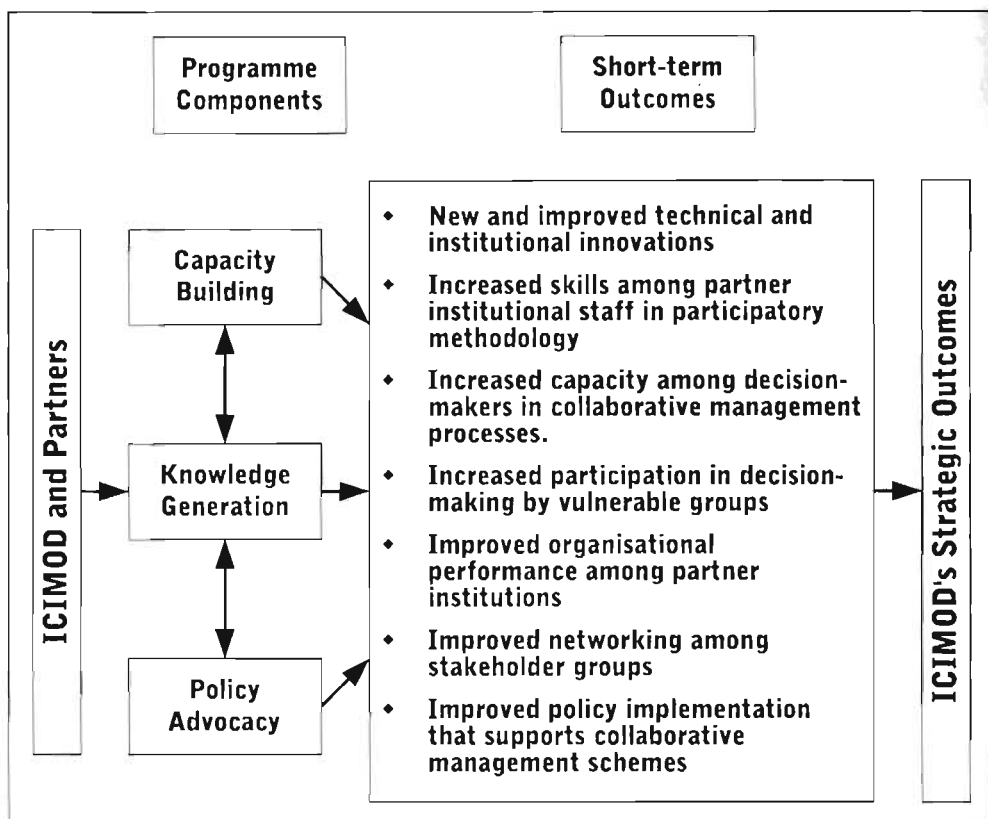


Figure 1: Programming Logic Model for RRP Phase II

Knowledge generation

To promote and support institutional and technical innovations through local partnership for improved rangeland management in pilot areas, using a co-management approach

Innovation Testing – The first Training of Trainers and follow-up field level trainings will culminate in action plans for innovations identified and implemented by local and national stakeholders within pilot pastoral communities, building on the outcomes of the RRP-I. Entry points for innovation will revolve around natural resource management but can include technical or institutional strategies other than traditional livestock and pasture development, such as ecotourism, marketing, or value addition, depending on what is identified in the assessment process.

Participatory Monitoring and Evaluation System Development – As the innovation process develops, indigenous indicators for success will be identified and incorporated into a systematic and internal monitoring and evaluation programme. This will include a series of reflection exercises designed to help organisations and pilot community groups identify constraints to and opportunities for improving service delivery to pastoral communities.

Policy advocacy

To enable policy dialogue and commitment to support co-management initiatives at a larger scale, building on the outcomes of the capacity building and innovation activities

Stakeholder Networks – Knowledge generated from the innovation and assessment process will be shared among stakeholder networks, identified and developed through participatory research at national and regional levels, using appropriate outreach mechanisms and through stakeholder exchanges across national borders. National and regional networks will be given training in how to develop and support local networking groups to ensure sustainability and relevance of information exchange at the local level.

Policy Dialogue – Continuous policy dialogue will be conducted to feed the results of stakeholder research and reflections to various levels of government and private sector bodies, including assessment of organisational readiness to 'scale-up' the developed methodologies and approaches beyond pilot sites. These forums will be conducted at both national and regional scales to address both country specific and transboundary issues, culminating in appropriate strategy frameworks and agreements to support collaborative efforts.

Assumptions and risks

Given the complexity of rangeland ecosystems in the region, a co-management approach is needed to work in these diverse cultural and ecological landscapes, an approach that embraces diversity and melding of knowledge systems to create sustainable and appropriate management models, and that promotes flexibility in programming. A long-term strategy has been proposed to improve the capabilities of relevant organisations to engage in a true process of collaboration, creating a supportive external environment that protects the rights of users, facilitates conflict resolution, and promotes timely financial and technical inputs in the face of uncertainty.

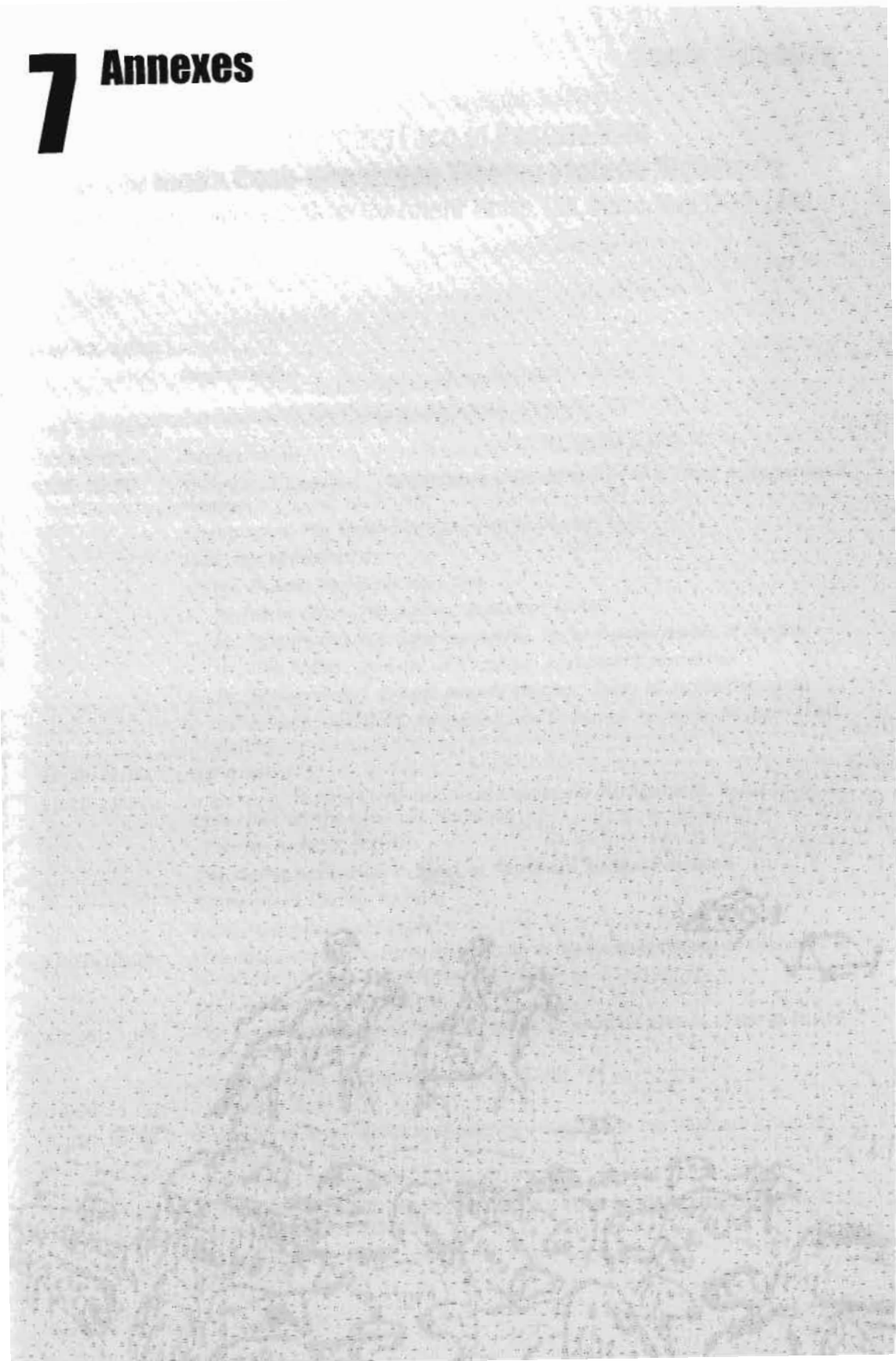
However, for this project to be successful in the long-term, local and national governments must support this process. Critical commitments on the part of collaborating organisations and those responsible for decision-making in pastoral regions are the following.

- 1) To support a cadre of professionals who understand and respect the fundamental nature and value of opportunism evident among pastoral people in response to variable and complex rangeland environments
- 2) To sustain the role of these 'change agents' and build their capacity to facilitate processes of change, among various governance levels and within their own organisations
- 3) To grant greater decision-making and legal authority to customary (or newly formed) pastoral institutions so that their adaptive mechanisms form the core of development and conservation initiatives
- 4) To promote technical approaches that match the environment in which they are tried through the process of action research
- 5) To support effective communication and network mechanisms to feed back results of action research to key decision-makers

- 6) To commit to a process of internal reflection and change if they are to effectively implement flexible and appropriate strategies and policies

From experience, ICIMOD has found that engaging policy-makers and researchers in local level action research initiatives has begun to bring about fundamental changes in attitudes and organisational performance, which is the foundation to developing supportive policies for decentralised decision-making. This is certainly a slow and painstaking process, but one which in the long-term will prove to be more cost effective and sustainable.

7 Annexes



The Changing Face of Pastoralism in the Hindu Kush-Himalayan Tibetan Plateau Highlands: Forging a Sustainable Path for the Future' Lhasa, TAR, China, May 12-19, 2002

May 12, 2002

16:00 – 19:00 **Registration**

May 13, 2002

8:30–9:00

Registration

9:00–10:30

Inaugural Session – Organising Committee of the Tibet Autonomous Region

Chairperson: Ms. Tsering Drolka, Vice Governor, TAR

Welcome addresses by

- *Mr. Ja Bao, Vice Governor, TAR*
- *Professor Chen Zheng Rong, President TAAAS*
- *Ms. Brigitte Dekrout, Representative, Federal Government of Austria*
- *Dr. Dirk Pottier, Director of Research, European Commission*
- *Dr. Mohammed H. Emadi, Deputy Minister, Dept. of Agriculture, Iran*
- *Dr. Ahmed Sidahmed, Rangeland and Livestock Technical Advisor, IFAD, Rome*

10:30–11:00

Tea break

11:00–11:30

Improving Pastoral Livelihoods and Rangeland Management: Framework and Objectives for the Strategy Workshop

- *Camille Richard, ICIMOD*

The Agri-Karakorum Project of Northern Areas, Pakistan

Chairperson: Camille Richard

Rapporteur: Dr. Han Jianlin

11:30–12:00

Livestock, fodder, pastures and people in the Northern Areas of Pakistan: an introduction to the Agri-Karakorum Project

Dr. Alan Duncan, MLURI, UK

12:00–13:00

The nutritional economy of the livestock production system in the Northern Areas of Pakistan

Abdur Rahman, Doctoral Candidate, MLURI, UK

13:00–15:00

Lunch and rest

15:00–16:00

Productivity and utilisation of pasture resources in the Northern Areas of Pakistan

Raja Omer, Doctoral Candidate, MLURI, UK

16:00–17:00

Human and economic issues associated with livestock production in the Northern Areas of Pakistan

Dr. Juergen Clemens, University of Bonn, Germany

- 17:00-17:30 Agro-pastoralism in the Northern Areas of Pakistan: a systems approach to research
Dr. Iain Wright, MLURI, UK
- 17:30-18:00 Discussion
- 18:00-18:30 Memorial to Dr. Jim Ellis of Colorado State University, USA
Dr. Ahmed Sidahmed, Int'l Fund for Agricultural Development, Rome
- 19:30-22:00 Banquet

May 14, 2002 Pastoral Production Systems in the Highlands of the Region

Chairperson: Dr. Mohammed H. Emadi

Rapporteur: Camille Richard

- 9:00-9:30 The Changing Pastoral Systems of Balochistan: Endangered Migration
Dr. A.W. Jasra, NADRI and M. Afzal, AZRI, Pakistan
- 9:30-10:00 Balancing Pashmina Production and Wildlife Conservation in Tibet and Ladakh
Dr. Tsering Phuntsog, Ladakh Sheep Husbandry Department, Norbu Tsering, Tibet Academy of Social Sciences, and Yeshe Dorje, TAAAS
- 10:00-10:30 Nomad People Should Be the Major Concern in Grassland Policy: Case Study from the Eastern Tibetan plateau, China
Yan Zhaoli and Wu Ning, Chengdu Institute of Biology, and Camille Richard, ICIMOD
- 10:30-11:00 Tea break
- 11:00-11:30 Community-based natural resource management and pastoral tenure among Kazakhs in the Tian Shan and Altay Shan mountains of Xinjiang
Dr. Tony Banks, Massey University, New Zealand
- 11:30-12:00 Historical use, present management and perspectives for medicinal plants management in the high pastures of Gunasa, Dolpo, Nepal
Dr. Yildiz Thomas, WWF People and Plants Programme, France, and Yeshe Choden Lama, WWF Nepal
- 12:00-12:30 Community based management of grassland in Maqu County, Gansu
Prof. Du Guozhen, State Key Lab of Arid-Agroecology, Lanzhou University, Gansu, China
- 12:30-13:00 Discussion
- 13:00-15:00 Lunch and rest
- Successful Pastoral Development Approaches**
- Chairperson: Dr. Ahmed Sidahmed
- Rapporteur: Dr. Alan Duncan
- 15:00-15:30 Changing Perspectives in Livestock production
Dr. John Chesworth, EU-China Panam Integrated Rural Development Project (PIRDP)
- 15:30-16:00 Sustainable Development of Animal Husbandry in the Pastoral Areas of W. Sichuan
Ze Bai, Director, Sichuan Grassland Institute, China
- 16:00-16:30 Sustainable Pasture Development in Nakchu: Past Experiences and Future Directions
Nyima A. Dock, Tibet Poverty Alleviation Fund
- 16:30-17:00 Tea break

- 17:00-17:30 An Overview of TAAAS's Rangeland and Livestock Research Program
Professor Chen Yuxiang, Director TAAAS Livestock Research Institute
- 17:30-18:00 Nomads and Markets – Challenges of Decentralised Production: The Case of Yak Cheese
Ethan Goldings, TRACE Foundation, USA
- 18:00-18:30 Tenure and Management Arrangements for China's Forestland and Grassland Resources: Fieldwork Findings and Legal and Policy Recommendations
Dr. Li Ping, RDI Beijing
- 21:00 **Film Night:** 'Pastoral Politics', Vasant Sabarwal, India
'Himalaya' (Caravan), Eric Valli, Nepal
'Pastoralism in the Andes', South America

May 15, 2002 Successful Pastoral Development Approaches

Chairman: Dr. Amjad Tahir Virk, IUCN Pakistan

Rapporteur: Ms. Jayalakshmi, Mountain Forum

- 9:00-9:30 IFAD's experience in supporting Community Based Livestock and Rangeland Development
Dr. Ahmed E. Sidahmed, International Fund for Agricultural Development, Rome
- 9:30-10:00 A Community-based Approach to Mitigating Livestock-Wildlife Conflicts in Ladakh
Rinchen Wangchuk, Snow Leopard Conservancy, India
- 10:00-10:30 Eco-tourism as a Livelihood Option for Pastoral People of the Highlands: Experiences from Sikkim and Ladakh
Nandita Jain, TMI, USA
- 10:30-11:00 Tea break
- 11:00-11:30 Improving Extension with Participatory Project Management Models in the Gannan Grassland and Animal Husbandry Department, Gansu
Zhao Qun, Yunnan Academy of Social Sciences, and Tang Zhongming, Gannan Animal Husbandry Bureau, China
- 11:30-12:00 How much participation? Experiences with participatory approaches in pastoral development
Dr. Wolfgang Bayer & Dr. Ann Waters-Bayer, Germany
- 12:00-12:30 Holistic and Community-based Approaches to Building Sustainable Livelihoods for Herders in Mongolia
Dr. Ayurzana Enkh-Amgalan, Centre for Policy Research, Mongolia
- 12:30-13:00 Discussion
- 13:00-15:00 Lunch and rest
- Afternoon Session**
- Chairperson: Dr. Ankh-Amgalan
- Rapporteur: Dr. Yash Veer Bhatnagar
- 15:00-15:30 Pastoralists, Government, and Natural Resources in Iran: Applications in Participatory Action Research
Dr. Mohammed H. Emadi, Deputy Minister, Department of Agriculture, Iran
- 15:30-16:00 Where There is No Doctor: Building the Capacity of the Himalayan Amchi to Serve Pastoral Communities
Amchi Tenzing Bista, Dr. Ghyachho Bista, Lo Kunfen School, and Yeshi Choden Lama, WWF-Nepal

16:00-16:30	Integrated Planning with Herders in the Jigme Dorje National Park, Bhutan <i>Tsewang Wangchuk, Ministry of Agriculture RGOB</i>
16:30-17:00	Tea break
17:00-17:30	Discussion
17:30-19:30	Poster Session

May 16, 2002 Field Visit to Dangxiong Pastoral Region of North Tibet

7:30	Depart for Dangxiong
9:30-17:00	Cultural Fair, Visit TAAAS research station and Yak Breeding Farm
17:00	Return to Lhasa

May 17, 2002 Working Groups and Field Trip

9:00-12:30	Demonstration of IFAD's Livestock and Rangeland Knowledge Base Located at International Cooperation and Training Center, TAAAS <i>Dr. Ahmed Sidahmed, IFAD</i>
9:00-12:30	Working Group: Developing an Agro-pastoral Conceptual Model for the Agri-Karakorum Project, Northern Areas Pakistan <ul style="list-style-type: none"> • Discussion and Strategy Recommendations <i>Group Leader: Dr. Iain Wright, MLURI, UK</i>
9:00-12:30	Working Group: Rangeland Conservation on the Tibetan plateau <ul style="list-style-type: none"> • 'One Yak Two Cranes' Dairy Development and Conservation in Tibet <i>Chris Ladue, TMI</i> • WWF's Conservation Initiatives in Tibet <i>Dawa Tsering, WWF</i> • Pastoralism and Wildlife Conservation in Western Tibet <i>Ingela Flatin, Network for University Cooperation Tibet-Norway</i> • Discussion and Strategy Recommendations <i>Group Leader: Dr. Ganesan Balachander, TMI</i> <i>Facilitator and Translator: Mr. Li Bo, Center for Biodiversity and Indigenous Knowledge, Yunnan</i>
12:30-14:30	Lunch and rest
14:30-18:00	Field Trip: Combining Juniper Restoration with Rangeland Regeneration <i>Dr. Sabine Mieke, University of Marburg, Germany</i>
19:30-22:00	Dinner and Cultural Show

May 18, 2002 Working Groups and Closing

9:00-12:30	Working Group: Appropriate Institutional Arrangements and Policies for Community Based Rangeland Management <ul style="list-style-type: none"> • Hypothetical Tenure Models for Rangeland Improvements <i>Camille Richard, ICIMOD, and Tan Jingzheng, Sichuan Forestry College</i> • Discussion and Strategy Recommendations <i>Group Leader: Dr. Tony Banks, Massey University, New Zealand</i> <i>Facilitator and Translator: Mr. Tan Jingzheng</i>
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9:00-12:30	Working Group: Integrated Research and Extension Needs for Participatory Rangeland Management and Pastoral Development <ul style="list-style-type: none"> • Discussion and Strategy Recommendations <i>Group Leader: Dr. Wolfgang Bayer</i> <i>Facilitator and Translator: Mr. Li Bo</i>
12:30-14:30	<i>Lunch and rest</i>
14:30-16:00	Working Group: Opportunities for International Scientific Cooperation <ul style="list-style-type: none"> • International Science and Technology Co-operation under EC's FP6 <i>Dr. Dirk Pottier, Scientific Officer for General Research, European Commission</i> <ul style="list-style-type: none"> • Discussion and Strategy Recommendations <i>Group Leader: Dr. Dirk Pottier</i> <i>Facilitator and Translator: Dr. Han Jianlin, International Livestock Research Institute</i>
16:00-16:30	<i>Tea break</i>
16:30-18:00	Synthesis of working group sessions (Working group leaders) – plenary
18:00-18:30	Close of meeting

May 19, 2002 **ICIMOD Regional Rangeland Programme Coordinators meeting (for institutional partners of ICIMOD's RRP)**

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Also from ICIMOD...

A Man Called Nomad, Directed by Alex Gabbay

Gansu Province/China, 38 min, English, (also available in Mandarin). 2002 (Format: VHS & VCD)

Winner of 13 International Awards (as of April 2004)

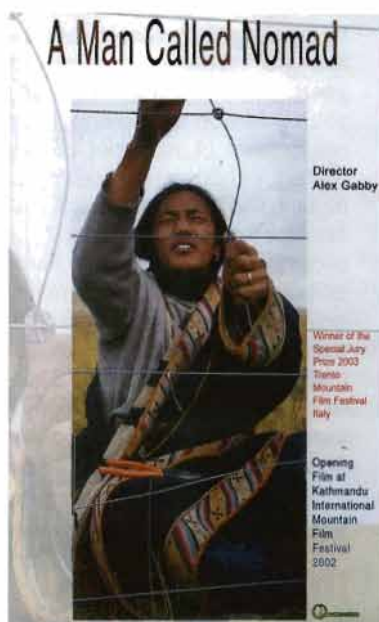
Price: VHS US\$ 20.00 (Developed Countries); US\$ 15.00 (Developing Countries); US\$ 10.00 (ICIMOD Member Countries)

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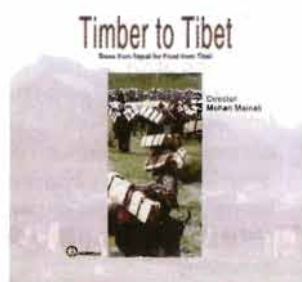
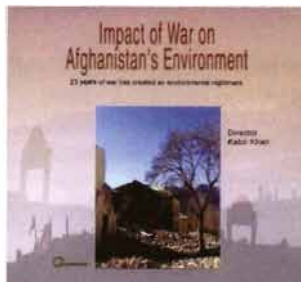
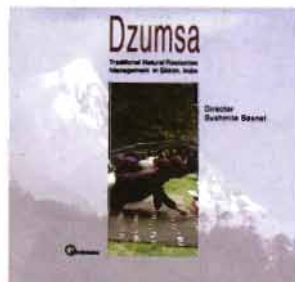
In 2002 the International Centre for Integrated Mountain Development (ICIMOD) and The Mountain Institute (TMI) commissioned the Himal Association in Kathmandu to call filmmakers from South Asia to submit proposals for making films on culture and natural resources management in the Hindu Kush-Himalayan regions of Afghanistan, Bangladesh, China, India, Myanmar, Nepal and Pakistan. Four of forty proposals were selected on the basis of the strength of the proposals, the background of the filmmakers, and geographical diversity and commissioned with a grant from The Ford Foundation, New Delhi, India.

The outcome has been four very different portraits of four places in the Hindu Kush-Himalayan region showing the diverse ways in which culture and natural resource management are linked.

A Man Called Nomad is a story of a man trying to adjust to the shifting realities of the modern world and how he can retain within his family a sense of place as fences begin to cross the once-open plain. For generations, the plains of the Tibetan plateau provided ample grazing for his people's yak herds. Looking into the life of a 30-year-old Choegatar, father and provider, we are invited into a world where the temptations of the town intrude. Synthetic fibre is replacing wool, and a man needs capital. This is an honest portrayal of life changing, all against the backdrop of unrivalled personal and natural beauty.



Other films in the series



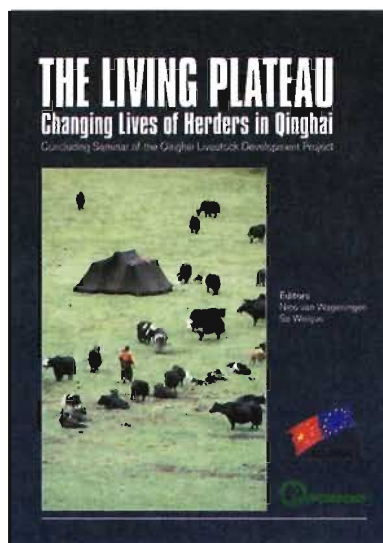
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The Living Plateau: Changing Lives of Herders in Qinghai

96p. ISBN: 92-9115-376-1

Price: US\$ 15.00 (Developed Countries); US\$ 10.00 (Developing Countries); US\$ 7.50 (ICIMOD Member Countries)

The Qinghai Livestock Development project was implemented by the Qinghai Provinces Bureau of Animal Husbandry with technical assistance from the European Commission over five years, with the aim of improving the livelihood of sheep and yak herders on the Plateau. The project facilitated activities of researchers, of provincial, county, and township development officers, of herder representatives, and of teachers of a training institute. This book is the outcome of a summing up seminar held in 2000 to document and share with other projects and organisations, the findings and lessons learnt and the priorities for future action. Although the project was only able to make a modest contribution to improving the herders' situation, the information gathered will be very useful for all those interested in the real situation in this area, as a guide for future and ongoing innovations, and as an interesting source of information for those working in areas downstream that are affected by changes in the uplands.



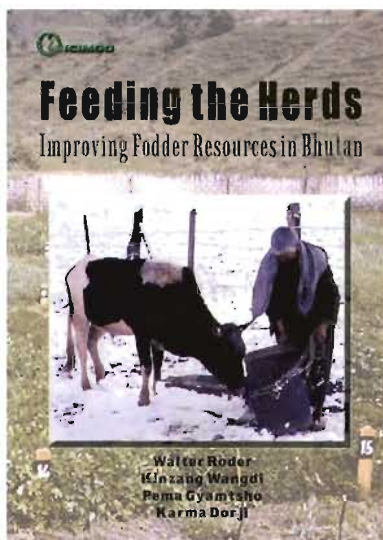
Feeding the Herds: Improving Fodder Resources In Bhutan

Walter Roder, Kinzang Wangdi, Pema Gyamtsho and Karma Dorji 2001. 124p ISBN:92-9115-409-1

Price: US\$ 20.00 (Developed Countries); US\$ 15.00 (Developing Countries); US\$ 10.00 (ICIMOD Member Countries)

This book provides substantial information on the grassland and fodder resources in Bhutan and their management. It is the result of a review completed in 2001 carried out by the Renewable Natural Resources Research Centre Jakar, and contains a comprehensive summary of the results of more than forty years of research into improving livestock fodder resources. Information obtained from the numerous available references was supplemented with information collected from various surveys planned and carried out as complementary activities for the review.

The book provides both a wealth of technical information and also a good insight into the legislative and farming systems framework for Bhutan's forage development programme. It is not only concerned with research, it also looks at extension activities and the impact of research and extension at the farmers' level. The constraints to fodder development are discussed, as are policy issues and future needs and directions.



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ISBN 92-9115-846-1

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