

Strategic Innovations for

Improving Pastoral Livelihoods






in the Hindu Kush-Himalayan Highlands

Volume II: Technical Papers



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

(Volume II: Technical Papers)

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

Editors

Camille Richard
Kate Hoffmann

International Centre for Integrated Mountain Development (ICIMOD)
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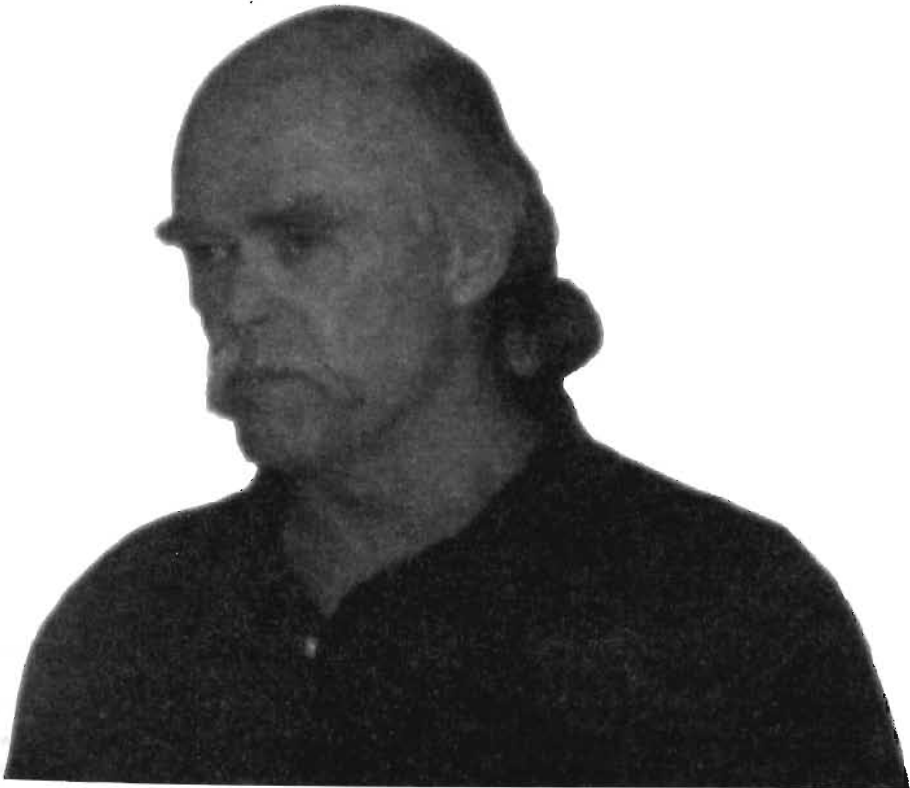
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Note: The affiliation and professional positions of the various participants were those current at the time of the meeting.

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 Yinzhen, Xiehui, Xiong Weiping, Liang Chunfang, Deji, Lu Yuling, Danzong, 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 Jinzhong 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.

Note: the papers in this volume have been edited into the current form, in some cases without further review by the authors.

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

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Executive Summary

Acronyms and Abbreviations

- 1** ICIMOD's Regional Rangeland Programme and the Objectives of the Lhasa Regional Workshop
- 2** Integrated Research on Pastoral Production Systems
- 3** Integrated Development Approaches: Improving Access to Rangeland Technologies, Markets, Alternative Incomes, and Financial and Social Services
- 4** Enabling Institutional and Policy Change to Support Collaborative Pastoral Development and Rangeland Conservation
- 5** Outcomes of the Lhasa Working Group Sessions
- 6** Strategic Innovations for Improving Pastoral Livelihoods in the Highlands of the Hindu Kush-Himalayas

Annex 1: Agenda

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

Community-based Natural Resource Management among Kazakhs in the Tian Shan and Altay Shan Mountains of Xinjiang



Community-based Natural Resource Management among Kazakhs in the Tian Shan and Altay Shan Mountains of Xinjiang

Tony Banks

Massey University, New Zealand

Introduction

The purpose of this paper is to describe and explain institutional arrangements for the management of rangelands in the Tian Shan and Altay Shan mountains of Xinjiang, with a particular focus on herding arrangements. The paper takes a 'bottom-up' approach by both focusing on de facto arrangements in the field and drawing extensively upon pastoralists' own explanations for these arrangements. The specific study region is the Yili Kazakh Autonomous Prefecture. Most of Xinjiang's fertile rangelands, and the majority of its 1.2 million mobile pastoralists, are found within this region. Starting in Yili Valley in the central Tian Shan mountains, the prefecture stretches northwards along the Kazakhstan border to the Altay mountains of northern Xinjiang. Virtually all of the rangeland in the region is utilised on a seasonal basis. There are three major seasonal types of rangelands: winter pasture, comprised of desert steppe; spring-autumn pasture, comprised of low-montane shrubland or forest steppe; and summer pasture, comprised of alpine and sub-alpine meadow and steppe and forest steppe (Zhang 1992). Although some 80% of pastoral households in Xinjiang have been officially 'settled', settlement has not essentially changed these seasonal migratory patterns.

This paper is based on a series of participatory appraisals of institutional arrangements for rangeland management that were conducted in all four prefectures and 11 pastoral counties of the Yili-Kazakh Autonomous Prefecture in 1998 and 2001². It is organised as follows. Key characteristics of institutional arrangements for rangeland management are described first. This is followed by a discussion on the social, economic, and environmental benefits associated with contemporary institutional arrangements. Implications and recommendations for rangeland policy are then considered in the last sections.

¹ The official household settlement criteria include: a permanent household dwelling; a livestock shelter; and the cultivation of fodder crops and/or artificial pasture.

² The pastoral counties where participatory tenure appraisals were conducted were: Altay and Buerqin (Altay Prefecture); Bole and Wenquan (Bertala Prefecture); Ermin and Wusu (Tacheng Prefecture); and Huocheng, Zhaosu, Cabuacer, Tekeshi and Gongliu (Yili Prefecture). All of these are located in northern Xinjiang, where its extensive rangelands and mobile pastoralists (principally Kazaks and Mongolians) are also concentrated. The appraisals undertaken in 1998 formed part of the author's fieldwork towards a DPhil (Development Studies) from the University of Sussex. The 2001 appraisals were undertaken by the author for the World Bank's Gansu and Xinjiang Pastoral Development Project.

Institutional arrangements for natural resource management

Communes were de-established in Xinjiang in 1984, and the legal and regulatory framework for pastoral tenure has been evolving since then³. Contemporary rangeland policy in Xinjiang emphasises the assignment of rangeland use rights to individual households and the establishment of exclusive boundaries in rangelands via fencing. Stocking rates for individual household pastures are to be derived, monitored, and enforced by Grassland Supervision Stations. Rangeland policy has been implemented in the field through the issuance to pastoral households of Grassland Use Certificates in 1989 and Grassland Use Contracts starting in 1993. By 1999, some 94% of Xinjiang's useable rangelands had reportedly been contracted to individual households (Xinjiang Animal Husbandry Bureau statistic). On the surface, Xinjiang's rangeland policy differs little from national rangeland policy, or for that matter, rangeland policies in North America and Australasia. All are essentially based on the 'household ranch model'. However, an important proviso needs to be added. Although Xinjiang rangeland policy may emphasise the establishment of the individual household ranch, it simultaneously provides wide and varied grounds for exceptions. For example, the grassland contract system should "be appropriate for local conditions" and "take into account pastoralists' lifestyle and herding traditions" (XG 1996). Furthermore, the contracting of rangelands to groups as opposed to households is explicitly encouraged in the case where the rangeland is serviced by only one water source (XAHB 1994) and for those rangelands in the vicinity of collective facilities such as stock routes, shearing sheds, watering holes, stock dips, and stud stations (XG 1996, XAHB 1994). The rest of this section considers key aspects of *de facto* pastoral tenure, and in doing so sheds light on if and how rangeland policy has actually been implemented in the field.

Group tenure

As mentioned above, Xinjiang rangeland policy emphasises the establishment of individual household tenure but provides grounds for exceptions. One of the key characteristics of contemporary pastoral tenure in Xinjiang is the persistence of group tenure arrangements. The origins of these group tenure arrangements (hereafter called pasture groups) dates back to 1985 when commune rangelands were initially distributed to small groups of households as opposed to individual households. Data on these pasture groups for two case study Kazakh villages in Buerqin County, Altay Prefecture, is presented in Table 1 below. Two points in particular are worth noting. First, there is a strong kinship basis to the pasture groups, with 89% and 90% of the members of groups in Ak Tubeq and Sarkum, respectively, being immediately related to all or some of the other households in their group. This basing of the pasture groups in pre-existing social structures, coupled with the tendency for pasture group members to cooperate across a range of social and economic spheres (including herd supervision, hay cutting, cropping, and seasonal movements), suggests that there is a high degree of social capital among group members.

The second point to note from Table 1 is that although some of the original pasture groups subdivided between 1985 and 1998, the majority of them have persisted, and

³ Significant contributions to the Xinjiang legal and regulatory framework include the: Xinjiang Rangeland Law (1989); Regulation on the Collection and Use of Grassland Management Fees (Xinjiang Government Regulation No.247, 1992); and Regulation on the Grassland Contract in Xinjiang (Xinjiang Government Regulation No.88, June 1996). See Banks (1999) for a fuller exposition of the legal and regulatory framework.

Table 1: Pasture groups in two Kazakh villages

	Number of households in group		Kinship relationship of sample household to other households in group (%)			Original groups that have subdivided (%)
	Range	Mean	All related	Some related	None related	
Ak Tubeq						
- 1985	3 – 6	4.6	74	15	11	6
- 1998	3 – 12	6.0				
Sarkum						
- 1985	1 – 5	2.7	84	6	10	36
- 1998	1 – 8	3.2				

Source: semi-structured survey of a 30% random sample of households in Ak Tubeq and Sarkum village, 1998 (143 households total).

the average size of the groups in both villages has increased because of the creation of new households. It is also worth noting that pasture groups in Sarkum have persisted, despite the official settlement of the village between 1989 and 1994 (as part of World Food Programme Project No. 2817) and the implementation of the grassland contract system in both villages in 1996. Grassland use contracts issued to households usually do not delineate individual household boundaries, and although they specify the area of different seasonal pastures contracted to the household, this area is calculated on the basis of household population and labour force in 1984 and does not usually refer to any defined area. Indeed, the incidence of individual household tenure has remained nil in Ak Tubeq and actually decreased from 10% to 5% in Sarkum between 1985 and 1998.

Fuzzy boundaries

A second key feature of pastoral tenure is the presence of fuzzy boundaries. There has been virtually no fencing of rangeland boundaries in Xinjiang. The monitoring and enforcement of boundaries is instead undertaken through the direct observation and action of community members in the field. The degree to which boundaries are monitored and enforced varies considerably according to the type of boundary (external or internal) and the seasonal type of pasture. External (community) boundaries in rangelands are quite closely monitored and enforced during the season by pastoralists in the field and during other seasons by 'grassland protector households', or households that are paid by the collective to reside in pastures all year round and prevent encroachment. The monitoring and enforcement of internal (pasture group or household) boundaries varies according to the seasonal type of pasture. In spring-autumn pasture, internal boundaries in pasture are often not enforced at all, and a form of internal open access prevails. In summer pasture, in contrast, there is some adherence to internal boundaries, particularly with respect to the herding of small livestock, and in winter pasture for small livestock, internal boundaries are strictly enforced. Adding to the overall fuzziness of boundaries is the informal rule that pastoralists may transit across another community's or group's boundaries during the course of their regular migrations between seasonal pastures or in order to access scarce water resources. This rule has the most implication for boundaries in spring-autumn pasture, given its location in the transition zone between summer and winter pasture, coupled with the relatively patchy distribution of water resources within these landscapes. Thus, the rule contributes to and helps to explain the high degree of boundary fuzziness in spring-autumn pasture.

Regulation of seasonal use

Village leaders, in coordination with county and townships officials and with the support of community members, play an important role in the regulation of the seasonal use of pasture. Usually, at least one village leader or deputy leader will be represented in each major seasonal pasture during their season of use, thus providing governance in the field. A key task of the village committee is the announcement, monitoring, and enforcing of rules relating to the timing of movements between seasonal pastures. The county sets general times for seasonal movements to help ensure inter-village coordination in the timing of migratory movements, and these are announced by the village leaders at village meetings. Village leaders, however, also have some discretion to adapt movement times in response to extreme climatic and/or irregular forage conditions. Village leaders play a major role in the monitoring and enforcement of seasonal movement rules. The timely movement of livestock away from villages' winter bases is particularly closely watched, as this is essential for the protection from livestock damage of natural cutting land and cropland in the vicinity of the winter bases. The transparency of seasonal movements, coupled with social pressure, helps to ensure high voluntary household conformity to movement times. However, village leaders can and do impose fines on those households that violate seasonal movement rules, particularly if there are no special circumstances surrounding the households' non-compliance. A second role played by village leaders is the organisation of the year-round stationing of 'grassland protector households' in the major seasonal pastures of the village to protect them against out-of-season encroachment by others. This is a particularly common practice for pastures that are susceptible to encroachment because of their proximity to agricultural villages also engaged in livestock raising.

Non-regulation of stocking rate intensity

Although rangeland policy prescribes to the Animal Husbandry Bureau (AHB) 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 for household pastures have been ascertained and are specified in households' grassland use contracts, but are not currently monitored or enforced. The lack of official stocking rates and/or their enforcement may not in itself be a problem, if for example, the official stocking rates are poorly calculated, or more generally, the fixed stocking rate approach used by the AHB is inappropriate given the high degree of environmental variability in northern Xinjiang (Banks 2001; Behnke et al 1993; Ho 2001). Nevertheless, there appears to be widespread evidence that spring-autumn pastures in particular have been subject to long-term degradation and that this is in part due to actual stocking rates surpassing long-term carrying capacities. This in turn signifies a current unmet need for some form of regulation of stocking intensity.

In summary, although there may be some room for institutional improvement in terms of the better regulation of stocking rate intensity, the overall pastoral tenure situation in Yili Kazakh Autonomous Prefecture is characterised by considerable exclusion and regulation of resource use. De facto use rights to pasture reside with clearly-defined groups or households, and in all but the case of spring-autumn pasture, internal boundaries in rangelands are largely observed and respected by resource users, despite the absence of fencing. At the community level, there is effective exclusion of non-community members from village pastures (even in spring-autumn pasture)

throughout the year, and also reasonably effective regulation of the timing and duration of use of different seasonal pastures. Thus, the pastoral tenure situation is far from one of open access or unregulated 'common property'. Any effort to facilitate the improvement of pastoral tenure needs to proceed from an understanding of the social and economic factors that underpin the contemporary pastoral tenure system. These factors are the focus of the next section.

Explaining institutional arrangements for NRM

Recent literature on property rights reform in rural China acknowledges the diversity of land tenure arrangements that can be found and explains this in terms of a decentralised process of land tenure change that has enabled local conditions to shape such arrangements (Kung 2000; Liu et al 1998). Similarly, this section proceeds on the basis that the conditions and interests of pastoralists have significantly influenced the implementation of rangeland policy in Yili-Kazakh Autonomous Prefecture and can help to explain the contemporary pastoral tenure system. During discussions with pastoralists, four social and economic objectives that underpin contemporary pastoral tenure were identified: 1) minimisation of exclusion costs; 2) realisation of economies of size with respect to herd supervision; 3) provision of social insurance via equal access rules; and 4) abatement of environmental risk. These are dealt with consecutively below, and a fifth, the minimisation of governance costs, is also considered.

Minimisation of exclusion costs

Exclusion activities at the village and group pasture level are subject to economies of size, and pastoral tenure arrangements facilitate the capturing of these economies. As previously noted, 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. In turn, the collective ownership of pasture underpins this institutional innovation. It would be much more difficult and costly, from a transaction cost perspective, for pasture groups or individual households to make their own arrangements for the protection of pasture from out-of-season encroachment. During the season in which pasture is in use, exclusion from group pasture is achieved by herders in the field. As will be elaborated on below, group herding arrangements save on the cost of herd supervision, and thus implicitly, save on boundary monitoring and enforcement costs as well. Group herding arrangements in turn are facilitated by group tenure arrangements.

Economies of size with respect to herd supervision

Pastoral households must economise on their use of labour, because the spatial demands on their labour are high. Contributing to the high spatial demands on household labour is the common practice of households grazing different types of livestock in different pastures at the same time of the year. The duration of this practice over a year is summarised for two case study villages from Buerqin County, Altay Prefecture, in Table 2 below. In the case of Ak Tubeq village, large and small livestock are grazed in separate locations for a total of seven and a half months per year; the comparable figure for post-settlement Sarkum village is four months. The second major reason for the high spatial demand on pastoral household labour is the need for households to simultaneously provide for the cutting of their hay and/or cultivation of their crops and the herding of their livestock in pastures over one

hundred kilometres distant. Thus, while small and large livestock are herded together in summer pasture (see Table 2), Ak Tubeq and Sarkum households must also cut their natural hayfields during this time of year, and Sarkum households must tend artificial pasture and crops.

Table 2: Number of months during which small and large livestock are kept separately in different seasonal pastures

Village	Winter	Spring	Summer (herded together)	Autumn	Total Months Per Year
Ak Tubeq	3	3	0	1½	7½
Sarkum					
- Pre-settlement	3	2	0	2	7
- Post-settlement	1	1	0	2	4

Source: village leaders and other key informants in the villages, 1998

Households can and do economise on the use of labour through the formation of group herding arrangements. A typical household can supervise a herd of 400-500 livestock, whereas the average household herd size for the region is around 120 head of livestock. Households realise these potential economies of size through forming group herd supervision arrangements. Herd supervision arrangements in the two case study villages are recorded in Table 3 below. The table highlights two characteristics of herding arrangements. First, group herding arrangements involving relatives and/or friends are the predominant type of herding arrangement, with their incidence in summer and winter pasture ranging between 72% and 80% of the households sampled in the two villages. Conversely, the percentage of households that individually supervise their herd (and only their herd) in summer and winter pasture ranges between 8% and 22%.

Table 3: Herd supervision arrangements (% of surveyed households)

Herd supervision arrangement	Summer		Autumn	Winter		Spring
	AT	SAR	AT	AT	SAR	AT
Individual household herd supervision	23	8	24	20	10	46
Group herd supervision (with relatives and/or friends)	77	76	76	80	72	54
Commercial herd supervision	0	16	0	0	18	0

Source: semi-structured survey of a 30% random sample of households in Ak Tubeq and Sarkum village, 1998 (143 households total). AT = Ak Tubeq; SAR = Sarkum

An exception to the clear predominance of group herd supervision occurs in springtime. In Ak Tubeq during spring, the incidence of individual household herd supervision (46%) is nearly as high as that of group supervision (54%). This reflects the reduction in potential economies of size in herding during the lambing season, when intensive supervision is required. A second characteristic of herding arrangements is the relatively low incidence of commercial herd supervision, with only 16% and 18% of Sarkum's sampled households using commercial herders in summer and winter, respectively, and none of Ak Tubeq's sampled households. That there are economies of size to be realised in herd supervision is best exemplified by the practice of commercial herders, who are paid per head of livestock, and thus have

an incentive to reap economies of size by grouping together several household herds until they have between 400 and 500 head of livestock to herd. Thus, commercial herd supervision usually also entails a form of 'group' herding arrangement.

Because group herd supervision implies joint household use of the same pasture, group herding arrangements are usually exclusive to members of the same pasture group. The same applies to commercial herding arrangements that involve the herding of more than one household's livestock. Group tenure arrangements therefore facilitate group herding arrangements, which in turn enable households to realise economies of size with respect to herd supervision.

Provision of social insurance via guaranteed access

It is well documented that the rural land tenure system in China provides 'social insurance' through guaranteeing household access to productive land (Dong 1996; Kung 1995; Kung 2000; Liu et al. 1998). Several characteristics of pastoral tenure in the case study region help to 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. In Table 4 below, pastoral households in Altay Prefecture are grouped according to their herd sizes. The size of household herds ranges from less than 50 to over 800 head of livestock. Some 28% of households have less than 50 head of livestock, whereas 23% of households have 300 or more head of livestock. Because households' entitlement to pasture, as given in their grassland use contracts, hasn't changed since 1985, but livestock ownership has become polarised, on-paper use rights to pasture are now more equitably distributed than livestock, and most significantly, poor households retain minimal formal rights of access. Second, access is also facilitated by group tenure arrangements, which guarantee their member households (and their offspring) access to all group pasture. Nevertheless, the proviso needs to be added that guaranteed household access doesn't translate into equal access or appropriation: those households within groups (and groups within villages) that have relatively large herds are likely to be appropriating more forage than those households (and groups) with smaller herds. Furthermore, the lack of adjustment of 1985 pasture entitlements in response to demographic changes (new households are expected to share the pasture of the husbands' fathers) means that the theoretical distribution of pasture has become less equitable on a per capita basis over time. This contrasts with the practice in cropland regions of villages of periodically reallocating land use rights in response to demographic change and in accordance with an equal entitlement rule (Dong 1996; Kung 1995; Kung 2000).

Table 4: Household herd sizes, Altay Prefecture, June, 1998

Herd Size	<50	51-100	101-200	201-300	301-400	401-500	501-600	601-700	701-800	800+
Number of households	6154	5372	5540	2963	1434	498	208	58	10	7
% of households	28	24	25	13	7	2	1	0.3	0	0
Cumulative %	28	52	77	90	97	99	100	100		

Source: Xinjiang Animal Husbandry Bureau, 1998

The pastoral tenure system also facilitates minimal access in cases where the distribution of pastoral resources is spatially uneven. Spring-autumn pasture in Altay, for example, has patchy forage and limited water sources. This contrasts with the case of summer and winter pasture, where forage is less patchy and water more evenly distributed via numerous mountain streams in summer pasture and snow in winter pasture. To bypass the problem of fairly distributing patchy pastoral resources in spring-autumn pasture, villages have often not demarcated internal boundaries in such pastures or, if they have, they agree not to observe them. Thus, an internal open access situation prevails, and every household is ensured access to water and forage.

Abatement of environmental risk

There is considerable climatic variability in the Yili-Kazakh Autonomous Prefecture, and periodically, extreme climatic events such as prolonged droughts or severe snowstorms. 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 helps to facilitate the abatement of environmental risk in several ways. First, as discussed in the previous section, leaders represented in the field have some discretion over movement times between seasonal pastures, and therefore can vary these slightly in response to available forage and climatic conditions. Second, within some village pastures (such as Altay's spring-autumn pasture) where there is significant spatial and temporal variation in forage, internal open access prevails, and this helps to ensure that environmental risk is shared between all groups and households. In contrast, if the use rights to such pastures were divided up between groups (or households), the exposure of individual groups (or households) to environmental risk would be much greater. Third, during particularly heavily snowstorms, it is common for those villages with both mountain and plateau winter pasture to transfer pastoralists and livestock from the former to the latter. Rangeland use rights in the plateau winter pasture are temporarily re-allocated to provide pasture to the new arrivals. This, of course, is facilitated by collective rangeland ownership and flexible boundaries.

Minimisation of governance costs

The overall costs of resource governance are minimised through a co-management approach, in which the state and community play complementary roles (Baland 1996). As previously noted, the state facilitates the coordination of seasonal movements through establishing dates for movements between pastures, and village leaders, with the support of community members, monitor and enforce these dates. This represents a lower transaction cost approach than either the state or community going it alone with respect to seasonal regulation. Likewise, the state acts as an arbiter of last resort, by providing formal land conflict resolution mechanisms, but village-based informal mechanisms offer a more timely and cheaper mediation process for pastoralists – hence the preference of pastoralists for utilising them. Potentially, the transaction costs associated with the derivation, monitoring, and enforcement of appropriate stocking rates could also be minimised through the adoption of a co-management approach. Currently, however, the community lacks any role in such tasks, and the Animal Husbandry Bureau arguably lacks sufficient resources to effectively undertake them by itself.

Implications for rangeland policy

Chinese and Xinjiang rangeland policy emphasises the need to establish individual household tenure and concrete boundaries (via fencing) in rangelands. The establishment of the household ranch appears to be the ultimate goal of rangeland policy. Whether or not this should be the case is contestable (Richard 2000; Miller 2000). However, less contestable is the fact that the contemporary pastoral tenure system in Yili Kazakh Autonomous Prefecture does facilitate the realisation of certain benefits and that some of these benefits will necessarily have to be foregone, or realised through other mechanisms, if pastoral tenure becomes more exclusive over time.

The first benefit of contemporary tenure identified in the previous section was the minimisation of exclusion costs. Exclusion, to the extent that it currently occurs, is achieved through institutional, rather than technological, means. Pastoral development strategies invariably emphasise technological means for achieving exclusion, and a higher level of exclusion than that which currently exists, in the future. However, the cost of exclusion by fencing is high relative to the income of pastoral households, in part because of the expansiveness of rangeland resources. Furthermore, fencing in itself does not guarantee greater exclusion. The problem of protecting pasture from out-of-season encroachment still exists, regardless of whether or not the pasture is fenced, and the current institutional mechanism for dealing with this problem, the 'grassland protector household', appears to have no immediate substitute. In Altay, some pastoralists who have been involved with fencing experiments note that fencing material itself, not just pasture, is susceptible to theft during seasons of non-use. This implies the need to constantly monitor and enforce fences, which defeats the purpose of fencing in the first place. Possible changes in the future, including greater social acceptance of fencing and a decline in its cost relative to the rising opportunity cost of herding labour, may make fencing a more feasible and economic means of exclusion. However, even then, it will not completely replace exclusion (or herding) labour, because problems of livestock theft, predator attacks, spring lambing, and the invariable tendency for fences to be leaky will necessitate the continuing presence of herders in the field. In the meantime, the usefulness of fencing is likely to be limited to key pastoral resources (such as hayfields, fodder croplands, and winter/winter-spring pastures) within the vicinity of households' winter bases, and institutional means of exclusion must be maintained elsewhere.

Another benefit of contemporary pastoral tenure, particularly group tenure, is that it facilitates the realisation of economies of size with respect to herd supervision. Theoretically, under a completely individualised tenure system, economies of size could be realised through other mechanisms, such as markets for grazing rights and herding labour. Because rural land markets typically involve high transaction costs (Dong 1996), they don't necessarily represent a low-cost mechanism for achieving size economies, when compared to existing group tenure arrangements. The policy implication is that whichever pastoral tenure path is followed, it must enable households to continue to capture, at relatively low cost, size economies in herd supervision.

The value of the social insurance role that the contemporary pastoral tenure system plays could conceivably decline in the long term. As the populations of pastoral communities stabilise, pastoral households diversify their sources of livelihoods

and/or out-migrate, and the state perhaps develops other social security mechanisms. Yet, in terms of the here-and-now, it is obvious that the distributional and welfare implications of any shift towards more exclusive tenure need to be thoroughly considered. Regarding the environmental risk management role that pastoral tenure plays, it should be acknowledged that this is relatively minor in comparison to other existing environmental risk management mechanisms, including the government provision of feed on a credit basis during the winter and pastoral households' cultivation of irrigated artificial pasture and fodder crops. Moreover, the further development of markets for grazing rights, credit, and feed could further reduce the need for the contribution to environmental risk abatement that contemporary tenure mechanisms make. Nevertheless, the effect of more exclusive tenure on environmental risk management needs to be considered, and the attenuation of group or individual rangeland use rights during extreme climatic events may well continue to serve a useful risk abatement role.

Finally, village authorities, with the support of community members and in conjunction with township and county governments, play important roles in the management of pastoral resources and perform these at lower cost than would other potential actors. Care must be taken that the existing authority of village leaders in the resource management sphere, which is underpinned by the collective ownership of pastoral resources, is not eroded through the introduction of a more exclusive tenure regime. In addition, existing village governance structures provide a potential basis for institutional improvement, including the better regulation of stocking intensity.

Conclusions: tenure for the times

The reason for which household ranches have yet to materialise on the steppes and mountain slopes of the Tian Shan and Altay region is that they are not yet appropriate, given the local socioeconomic and environmental conditions. The existing pastoral tenure system facilitates the realisation of numerous benefits: external exclusion; economies in herd supervision; social insurance; abatement of environmental risk; and seasonality of pasture use. In the absence of underlying changes in local conditions or the development of alternative mechanisms for the realisation of the above benefits, the enthusiastic implementation of the household ranch model could have detrimental impacts on pastoral livelihoods and natural resource management. This is not to imply that the de facto pastoral tenure system is flawless and shouldn't be changed. On the contrary, the lack of stocking rate regulation appears to be a major problem with the current system. Rather, the point to be emphasised is that the socioeconomic and environmental consequences of pastoral tenure change need to be carefully considered. And as difficult as it may be to devise, win-win pastoral tenure change that preserves the benefits of the current system but remedies its defects should be sought, rather than the still distant and elusive household ranch. Let's call this more modest goal 'Tenure for the Times', with Chinese Kazakh characteristics.

Whilst it is relatively easy to theorise about Tenure for the Times, implementing it is another issue altogether. To the author's knowledge, there is no known and proven pastoral tenure model in Yili Kazakh Autonomous Prefecture that is compatible with the Tenure for the Times goal. This absence in part reflects the traditional focus of pastoral development strategies on technological, rather than institutional,

improvement. Not much thought, let alone resources, has been devoted to improving the institutional arrangements that govern rangeland use. Given this legacy, the only way to realise Tenure for the Times is through a learning-oriented, experimental, and participatory approach to institutional improvement. The region, in short, needs more pilot pastoral tenure/natural resource management projects. Lessons learned from pilot projects in other regions of western China may have some relevance to Yili Kazakh Autonomous Prefecture.

One potentially promising idea to explore, and to which many Kazakh pastoralists have responded enthusiastically, is the greater formalisation of group tenure arrangements. This could enable the improvement of exclusion at lower cost, because the cost of fencing group pasture is less expensive per household than that of fencing individual household pasture. The persistence of group tenure would also facilitate the continued reaping of economies of size in herd supervision. Group tenure could also be compatible with improved stocking rate regulation, as the total number of stock units that could be grazed on the joint pasture could be calculated and divided among households according to a mutually agreed upon formula. Guaranteed access and a measure of social insurance could still be provided. For example, poor households that had small herds and grazed less than their quota of stock units could be compensated, in cash or in kind, by those that grazed more. Through preserving the benefits but rectifying the deficiencies of contemporary tenure, the strengthening of group tenure arrangements represents one possible pathway towards Tenure for the Times and is probably worthy of serious attention and trial.

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



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

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Introduction

About two-thirds of China's population resides in rural areas, relying on collectively owned rural land as a primary source of both current income and long-term security. The institutional arrangements under which rights to such land are held largely determine both the economic viability of rural households and the long-term sustainability of the land. The first stage of China's recent rural land system reforms involved the transition from collective ownership and management of rural land to a system under which the rights to use and manage collectively owned rural land were contracted directly to households. Although the earliest steps of the Household Responsibility System reforms involved only arable land, grassland resources would soon follow. For nearly 20 years, institutionalisation of the Household Responsibility System reforms has remained the underlying principle of Chinese rural land laws and policies.

In October, 1998, the 'Decision of the Central Committee of the Chinese Communist Party on Several Major Issues in Agriculture and Rural Work (Third Plenary Session Decision),' issued following the Third Plenary Session of the 15th Central Committee of the Communist Party of China, renewed the central government's commitment to the Household Responsibility System. The Third Plenary Session Decision called for the implementation of 'long-term protected use rights' to rural land and the drafting of additional legislation to protect those rights. The process of drafting new legislation governing rural land rights has already begun, and two pieces of legislation currently in the drafting process – a new Rural Land Contracting Law and a new Property Law – have the potential for great impact on China's rural land system, including non-arable land tenure arrangements.

With respect to arable land, both China's experience with the Household Responsibility System and the weight of comparative experience strongly support the proposition that strengthening households' individual use rights to such land will further the central government's underlying policy goals: providing incentives for long-term investments in land, increasing agricultural productivity, encouraging long-term land stewardship, developing a market for use rights to arable land, and strengthening social and political stability in rural areas. However, the specific policy goals related to non-arable land in China may differ substantially from those for arable land. Due to the nature of the resources themselves – and for geographic, historical, and cultural reasons – non-arable land resources have important poverty alleviation, environmental protection, and community support functions that may be emphasised to a greater degree than on arable land. Further, the evidence concerning the benefits of individualised tenure on grassland is more ambiguous. Although individualised

household tenure on non-arable land has been successfully implemented in some areas of China, in other areas, severe degradation or mining of resources has occurred. At the same time, a growing body of research both from within China and from around the world has pointed to the complexity of factors that must be taken into account in developing appropriate land tenure and management regimes for non-arable land, and has provided numerous successful examples of common property management approaches for grassland.

The ongoing process of legislative drafting brings rural land tenure issues to the forefront in China, and raises the important question of whether the same tenure arrangements that have been successfully applied to China's arable land are also the most appropriate for its grassland resources. This paper aims to help inform the legislative drafting process by providing evidence of a variety of successful approaches to grassland tenure, in China and elsewhere, and by offering a series of legislative and policy recommendations intended to facilitate the institutionalisation of such tenure arrangements within the specific context of rural China.

For the reasons stated above, and the two aspects discussed below, the Yunnan Center for Community Development Studies (CDS) and the Rural Development Institute (RDI) undertook the cooperative research project described in this paper.

One reason for this is that, in the course of prior interactions between CDS and RDI, we discovered that the research of our two institutes on China's rural land system includes many complementary aspects. The first is the focal point of the research. CDS has focused on non-arable land, and RDI has focused primarily on arable land, with some work on grassland tenure. The second complementary point is the direction of our respective work. CDS focuses mainly on the micro-level impacts of property rights systems, while RDI focuses on the direction of legal and policy system reforms. The third point is our respective research methodologies. CDS employs both rapid rural appraisal (RRA) and participatory rural appraisal, along with some small-scale questionnaire surveys, and RDI employs both rapid rural appraisal and large-scale questionnaire surveys. The fourth is the academic backgrounds of our researchers. CDS is an organisation comprised of researchers from a variety of disciplines, while RDI researchers are all trained in law.

A second reason for this partnership is a hypothesis, arrived at from previous field research, that says that local officials, as well as the vast majority of community members, believe that previous property rights systems governing non-arable land developed from and adopted – to the point of indiscriminately copying – the property rights system employed on arable land. However, whether this presumption reflected the actual situation, and any related consequences, remained unknown.

The first section of this paper, in addition to presenting an overview of existing land tenure arrangements governing grassland in China, also provides examples of common property resource management on grassland from the United States, Canada, Australia, and Mongolia. The next section presents a series of village case studies encountered during 14 days of rural fieldwork conducted by the authors, researchers from the Center for Community Development Studies (CDS) and the Rural Development Institute (RDI). This fieldwork was conducted in Zhongdian counties of Yunnan Province during August and September of 2001. The last section offers a series of preliminary conclusions and recommendations, developed from our fieldwork findings and a review of comparative research.

Grassland tenure systems: Chinese approaches and international comparative examples

Chinese approaches

Several characteristics of China's grassland resources have an important bearing on tenure and management arrangements. First, China's grassland area is large, comprising nearly 40% of its land area. Second, China's grasslands are primarily located in its northern and western provinces. This is significant both because poverty rates in provinces with relatively large grassland areas remain well above national averages (Mearns 2000) and because these provinces are home to relatively high ethnic minority populations (Mearns 2000). Third, China's grasslands incorporate a wide geographical and ecological diversity, from alpine meadows on the Tibet-Qinghai Plateau at an altitude of over 4,000 meters above sea level, to steppe and desert in arid regions such as Xinjiang (with less than 150 mm of annual precipitation), and hilly grassland in the sub-tropical zone of Yunnan Province or the semi-arid Loess Plateau (Ho 2001). Finally, and most importantly, it is estimated that 90% of China's grassland has been degraded to some degree, including 42% that is 'moderately or seriously degraded' (SDPC 1996, SEPA 1998). Furthermore, many officials and researchers consider land tenure and management arrangements to be a significant contributing factor to this ongoing degradation (Banks 2001, Li and Duo 1995, Longworth 1993, NRC 1992, Tuoman 1993, Wang 1993). 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.

Current grassland tenure policies in China were introduced in the early 1980s with the establishment of the Pastureland Contracting System (PCS). Parallel to the Household Responsibility System that had been implemented on arable land beginning in the late 1970s, the PCS adopted the household as the primary unit of contracting for grassland. The underlying principles of the PCS were first embodied in national legislation by the 1985 PRC Grassland Law, which remains the only national law governing grassland tenure and management. Under the Law, pastureland remains under the ownership of the state or collective unit and is contracted to households for 'long-term' use (PRC Grassland Law Article 4). The Law itself does not provide much insight into the question of pasture management, but related policies envisioned that allocation to individual households would be followed by the assignment of carrying capacities, and finally that a system of incentives and sanctions would be introduced to enforce compliance with the assessed stocking limits (Mearns 2000).

No comprehensive surveys addressing the extent and nature of implementation of central laws and policies concerning grassland have been published to date. Published figures for the percentage of contracted rangeland include 95% in Xinjiang, 90% in Gansu, 80% in Sichuan, and 80% in Inner Mongolia (Banks and Sheehy 2000, Yutang Li 1994). However, strict implementation of the policy of individualisation and enclosure of grazing land has actually been achieved in only a minority of China's grazing regions. In contrast to the uniformity that is embodied in national laws and policies, this research indicates that local approaches to grassland tenure and management remain in effect in much of China.

A review of relevant research indicates that where implementation of individual grassland allocation with enclosure has occurred, several important impacts on grazing communities have been observed. Individualised pastures make it extremely difficult, if not impossible, for communities to adopt approaches that allow increased mobility and flexibility of access to grazing resources, which may be essential to the survival of herds and to herders' livelihoods during periods of risk. Particularly in drier areas, this lack of mobility and flexibility has resulted in considerable harm to the long-term sustainability of grazing. Allocation and enclosure of grazing lands has also been shown to lead to increased conflicts within grazing communities (Williams 1996).

Research on grassland in China has emphasised the importance of geographical, historical, and political contexts in establishing tenure and management regimes that are productive, equitable, and sustainable (Mearns 2000). Specific factors that must be considered in establishing an appropriate tenure regime for grassland may include the following: (1) resource predictability or ecological dynamics as a measure of the need for mobility and flexibility in resource use, assuming limited external inputs; (2) policy context – the extent to which mobility is permitted or facilitated, where resource constraints demand it; (3) livelihood diversification – the availability (or lack thereof) of supplementary or alternative livelihood sources to at least compensate for any loss of livelihood from livestock production; and (4) socioeconomic differentiation – a measure of inequality in incomes and/or asset holdings, including livestock, among households within and between pastoral communities (Mearns 1999). The research concludes that '...it is essential that land tenure options be tailored to local conditions. Laws that mandate one option or another, rather than a permissive legal framework that provides for a range of adaptive options under different circumstances, are likely to work to the disadvantage of some areas of each country' (Mearns 2000).

Field research on grassland tenure in Altay Prefecture in northern Xinjiang Province found that existing group tenure arrangements provided important benefits to local herding households: including facilitating the realisation of economies of scale with respect to herding labour, affording equitable household access to resources, and providing insurance against economic risk (Banks 2001). The field research concluded that these important features of grassland tenure stem not from national or local policies – and in fact, run contrary to national and provincial policies mandating individualised tenure – but instead from the characteristics of grassland resource endowments, particularly their expansiveness and seasonal pattern of utilisation (Banks 2001).

International comparative examples

There are two main methods of pastureland management, each with its own country-specific variations. Under the common property model, property is used in common by a group, and the group itself conducts regulation. Early pastureland systems throughout the world centred on common property management, and many areas of Africa and Asia continue to rely on this approach. Under a second approach, which is utilised in most western countries, grazing land is privately owned or is leased by individual ranchers from the government, and regulation is conducted by government agencies. Within each of these broad management styles, there are multiple variations, some of which are explored in the individual country examples.

Communal grassland management in Mongolia

In Mongolia, individual rights to pastureland have never existed, and privatisation of pasture remains unconstitutional (Fernandez-Gimenez 1999). Rather, there has existed a complex of overlapping or nested tenures to a variety of resources, vested in groups of different sizes and social functions and governed by an array of formal and informal institutions. During thirty years of socialist government (1960-1990), pasture use was regulated by the state, through the mechanism of the 'negdel', or collective. To some degree, customary patterns of use and tenure guided negdel decisions. Since the demise of socialism in Mongolia (1990), pasture use has not been formally controlled. The collectives that once allocated pastures and campsites and directed seasonal movement patterns were dismantled in 1992, and state-owned livestock was privatised. Although some customary forms of social organisation quickly re-emerged – notably the traditional residential unit of the herding camp, or 'khot ail' – institutions to govern pasture use have not re-evolved in most places.

In 1994, the Mongolian 'Ikh Khural' (national legislature) passed the Land Law, which contained provisions for the regulation and management of pastureland, as well as the leasing of campsites and pasture (Mearns and Swift 1995). The Law supports the principle that all pastureland should remain public, or be held 'in common', and expressly recommends that grazing follow traditional seasonal movements between pastures (Mongolian Land Law of 1994, Article 51). The Law further provides for emergency reserve pastures, and movement of herders between provinces in the case of major climatic disaster. Management is decentralised, as the key government decision-maker in the new law is the 'bag', the lowest level in the territorial administration. These local decision makers have the authority to take measures to protect pastures, including suspending the use of any pasture that has been overgrazed and whose carrying capacity has been exceeded, or limiting the number of livestock (Mongolian Land Law, Article 51).

Exclusive use systems in the United States, Canada, and Australia

The other primary method of managing pastureland is to divide public land into individual parcels. One common approach – followed by governments in the United States, Canada, and Australia – is to lease government-owned grazing lands to individual herders. In the United States, the federal government owns public domain land that is made available for grazing. The majority of this land is managed by the Department of Interior's Bureau of Land Management (BLM), which allocates grazing permits to ranchers for a fee based on the number of animal unit months, representing the amount of feed required to feed the equivalent of one cow for one month, allowed for the particular piece of land (Olinger 1998). A similar system exists in Canada, where provincial laws in the Great Plains provinces of Manitoba, Alberta, and Saskatchewan allow for the lease of government lands to private individuals and grazing associations for a set fee. One such province, Alberta, sets the rent for such leases based on the grazing capacity of the land, the average weight gain of the cattle, and the price of beef (Alberta Public Lands Act, Chapter P-30 Part 4 Section 107).

In Australia, a high percentage of arid and semi-arid grazing land is owned by the government and held under leasehold title by private ranchers (Boer and Hannam 1992). Lease fees are required, and leases are made subject to maximum stocking rates, as well as maintenance and improvement requirements. The leases are long-term in nature and rarely revert back to the government, meaning that the leaseholder

is solely accountable for the condition of the land. Land degradation has been a severe problem in Australia, with approximately 1.5 million square kilometres of pastureland classified as severely degraded.

Each of these exclusive use systems is intended to prevent overgrazing by evaluating the quality of the land to be leased and determining maximum stocking levels based on that measure. In theory, exclusive use also allows herders to maximise the potential of his or her land through improvements on the land, such as digging wells for watering animals and reseeding pastures with beneficial varieties of plants. Herders operating under exclusive use regimes, however, are also exposed to significant risks, as they are unable to adapt to changing weather conditions and may have difficulty determining the optimal stocking level of the land – thus risking overgrazing, deterioration of range quality, and potentially the total loss of income. Exclusive use systems also require substantial investments in oversight and expertise, and the experiences of the United States, Canada, and Australia all indicate that effective implementation is extremely difficult.

Communal tenure versus exclusive use – several factors in setting policy

A number of general factors must be accounted for in determining whether communal tenure or exclusive use systems should be applied to grassland. These factors do not allow a definitive conclusion as to whether one particular tenure regime is superior to another, but they do lend considerable support to the notion that communal tenure arrangements may be more appropriate where certain circumstances are present. The following five attributes have been identified that might make a certain piece of grazing land more suitable for communal land tenure: (1) the value of production per unit of land is low; (2) the frequency or dependability of use or yield is low; (3) the possibility of improvement or intensification is low; (4) a large territory is needed for herding; and (5) relatively large groups are required for capital-investment activities (Ostrom 1991). Some type of common property system is usually most viable for such settings (Giovarelli and Hanstad 1999).

However, in determining what type of use regime is appropriate for pasture, one must be careful to distinguish between different types of pasture. For small-scale pasture, such as land around livestock shelters and pasture or hay fields cultivated by individual households, individualised private ownership or individualised use rights may be appropriate. However, for large-scale, uncultivated pastures used by a larger group of persons, some type of group or state ownership is likely to be appropriate.

While the touted benefit of privatisation (the elimination of overgrazing) has been and could continue to be achieved by common property systems, privatisation of grasslands itself has several drawbacks. First, establishing and updating a private property system is expensive. The costs of infrastructure, such as fencing, as well as administrative costs associated with enforcing grazing regulations, are high. To be feasible, privatisation must yield economic returns exceeding the administrative and material costs involved. Second, even if cost was not prohibitive, management flexibility, vital for effective management of a highly variable resource, is lost. Under a relatively rigid private property system, it is much more difficult for users to collaborate to overcome the effects of natural disasters, such as droughts. Also, the vast size of many grasslands make enforcement of grazing regulations by regulatory personnel very difficult. A more effective method is to have herders and farmers enforce grazing rules themselves.

Fieldwork findings

Fieldwork methodology

Researchers from CDS and RDI conducted fieldwork in Zhongdian County, Diqing Prefecture, Yunnan Province in August and September, 2001. The research team was briefed by county (or district) agricultural and land bureau personnel and by county animal husbandry officials. Based on consultation with county (or district) officials, individual villages were selected as fieldwork sites. Selection criteria included ethnic composition; composition and nature of land resources; presence of unique tenure arrangements; and importance of agriculture and herding to the village economy.

In each village, the CDS-RDI research team employed rapid rural appraisal (RRA) and participatory rural appraisal (PRA) as primary techniques during the course of interviews. When applying RRA and PRA, we took into account the following factors:

- asking for officials' opinions as well as listening to farmers' voices in the community, because officials from county or township governments accompanied us in the fieldwork;
- interviewing both village cadres and general farmers;
- conducting group discussions, as well as individual household interviews;
- paying attention to opinions from both male and female villagers.

We also employed a number of RRA and PRA visual tools such as resource mapping, community mapping, quarter calendar, big events, and points ordering. By using these tools, cadres and farmers are engaged in an active interview process, rather than being passive respondents to a questionnaire. Instead of adhering to a predetermined set of questions, interviewers are free to pursue items of interest discovered during the course of the interview. In addition, a series of interviewing tools are employed to encourage participation by interviewees. We asked cadres to prepare resource maps of their villages indicating the location, type, area, and use patterns of land resources. In order to obtain a sense of the land tenure changes that have occurred in each village, we also asked both cadres and farmers to describe the tenure arrangements on each type of village land since decollectivisation occurred in their village.

During the course of interviews, the specific composition of the research team varied from village to village. In some villages, researchers divided into two separate teams, with one team interviewing village cadres (including former cadres) while the other team interviewed farmers. In other villages, the entire research team conducted cadre interviews together, and then divided into two teams to interview farmers. Farmer interviews can be divided into two categories – group interviews and individual interviews. Where group interviews were possible, we randomly identified groups of men and women from the village and interviewed them separately in order to understand a range of attitudes and opinions towards land. Where, due to time constraints or farmers' involvement in harvesting, group interviews were not possible, we randomly identified individual farmers as interviewees. The research team spent one day in each interview village.

We emphasise local innovations in grassland tenure arrangements observed during fieldwork, and the attitudes and preferences of farmers and local officials with respect to these innovations. The emphasis on common property management arrangements presented in the village case studies below is not meant to invalidate individualised

household tenure as a policy option, but rather to illustrate the set of local considerations that has led to common property management, and its effect on grassland resources. In addition, we summarise important differences between arable land and non-arable land as expressed by farmers and cadres themselves.

Findings

Zhongdian County of Diqing, Tibet Autonomous Prefecture is a poor county with the largest landmass and area of grassland in Yunnan Province. The three villages in Zhongdian in which we conducted fieldwork interviews – Heping, Jidi, and Jiulong – have several common characteristics with respect to resource management. First, village land holdings (arable and non-arable) are vast compared to most areas of China. Second, agricultural productivity in the villages is limited, both as a result of small arable land areas (relative to more expansive grassland areas) and due to the fact that villages are located at altitudes of over 3000m. The main crops are potatoes and barley; the latter is grown both for household consumption and as a source of animal feed. Third, all three villages are ethnic minority villages, rather than Han Chinese villages. Fourth, all villages distinguish between 'collective pasture', located relatively close to the village, and more distant 'alpine pasture'. In two of the three villages – Heping and Jidi – 'household pastures' have also been created and allocated to households. Finally, common property management has traditionally been, and still remains, the tenure arrangement governing the vast majority of grassland in each of the three villages.

All alpine pastures in the three villages remain under common property management regimes, as do most of the collective pastures. Only the small household pastures present in Heping and Jidi are managed exclusively by individual households. However, we observed one important difference among the three villages with respect to grassland tenure arrangements. Two of the three villages – Jiulong and Jidi – have retained traditional common property regimes on all of their collective pastures, while Heping has enclosed a portion of its collective pastures and allocated individually-demarked rights to pasture within the enclosed area to village households for the production of feed grasses. The introduction of these 'man-made' collective pastures has been accomplished in recent years as part of the government's feed grass reform project. In addition to providing an overview of grassland tenure in the three villages, our analysis centres on their differing approaches to management of collective pasture. We first discuss natural pastures in Jidi and Jiulong Administrative Villages, and then man-made pastures in Heping Administrative Village.

Jidi Administrative Village

Jidi Administrative Village has 464 households and 2,465 rural residents scattered among its 17 natural villages. Land resources are abundant, totalling well over 100,000 mu (15 mu of land equals one hectare). Of this amount, arable land accounts for approximately 6,000 mu.

All three types of pastures – household pastures, collective pastures, and alpine pastures – are present in Jidi, with different tenure arrangements employed for each. Household pastures are small plots of land located near family residences that have been allocated to individual households. These enclosed pastures are not used for grazing or sheltering animals, but rather for growing and drying feed grasses. The specific land area for household pastures varies according to village small groups but is typically no more than two or three mu and can be as small as a fraction of one

mu. Household pastures were allocated to farmers in the early 1980s, following implementation of the Household Responsibility System on arable land. Most households have built large wooden scaffolds on their household pastures that are used for grass drying.

Most grazing occurs on collective pastures, which are owned by each of the 17 natural villages. Some collective pastures are managed as common grazing land for households belonging to an individual natural village, while other pastures are managed by several natural villages. Regardless of the scale of common property management, access is granted to members of the defined community. Village cadres reported that boundaries separating the collective pastures of different natural villages or larger communities are clear to farmers, and that these boundaries are enforced against outsiders with a system of fines for encroachment. No limits are imposed on households with respect to the number and kind of animals raised. Village cadres reported that very severe degradation of collective pasture has occurred.

Alpine pastures have traditionally been used by village herders, some of which are in the vicinity of the village, and others of which are located in remote mountains at altitudes of over 5000m. These alpine pastures have been managed under a common property regime for 'generations of generations.' Although the cadre described the alpine pastures as belonging to the administrative village and told us that access is limited to members of the administrative village, it seems more likely that they are subject to use by a much broader group of herders based on traditional herding patterns. This seems likely given both the distance from the village of some of the alpine pastures (the cadre estimated they were as far as 100 km away), and the fact that the administrative village cadre noted that past disputes over alpine pasture had involved herders from as far away as Sichuan Province. The cadre also told us that fewer households have grazed their animals in alpine pastures in recent years, choosing instead to remain in the villages during summer. As a result, he reported that the quality of alpine pastures is excellent, with very little degradation.

In two separate interviews, village herders opposed the idea of individualising all of the village's collective pasture. One herder, a 37-year old male, expressed a concern that individualisation of collective pasture would result in the creation of parcels that were too small for effective management. A woman herder with a total herd of more than 20 yak and yak hybrids told us that animals already have sufficient grass all year. During the months between April and August, she herds her yaks on collective pastureland. Between September and October, she feeds her yaks at home with the grass harvested from her individual household pasture. From November to January, she herds these yaks in alpine pastures. When alpine pastures are covered with snow between January and April, she returns home and feeds the animals with grass hay and barley straw she harvests from her arable land. She emphasised that individualisation of collective pasture would entail an enormous administrative burden, require substantial investments in fence building, and increase disputes among village households, without any commensurate benefits.

Jiulong Administrative Village

Due to unforeseen circumstances, we were only able to conduct one interview in Jiulong, with the village elementary school teacher. All other village residents had been organised into a search party to look for a villager who had been missing for

several days, and had therefore left the village. Following is the information we were able to obtain about Jiulong Administrative Village.

Grassland in Jiulong consists of collective pastures and alpine pastures, both of which are managed collectively. Household pasture has never been allocated. Most village households graze their animals in collective pastures from November to February and in alpine pastures from March to October. Collective pastures are open to members of each natural village, while alpine pastures are open to members of the entire administrative village. Only yaks and hybrids are grazed in alpine pastures, with herding typically done by specialised households. Specialised household herders may be residents of the village or outsiders. The farmer we interviewed reported that he and two other households combine to hire a specialised household to manage their herd during the summer months. Herding fees are paid in cash and kind, and the farmer estimated that he would pay approximately 200 RMB* this year for his five yaks.

The farmer interviewee dismissed the idea of individualisation of alpine pastures as impractical, given both traditional management preferences and current management practices. He also opposed the idea of individualising any collective pastureland on the grounds that it would result in many disputes among village households. However, the farmer did favour individualisation of another type of village land for growing feed grass. Each household within the farmer's natural village has been required to provide two mu of arable land as part of a project to return marginal land cultivated by villagers back to its original grassland use. One mu of the land must be returned to grazing land, depending on location within the village. Compensation in the amount of 300 jin (one jin is equal to 500 grams) of grain has been provided to households to help mitigate the impact of losing the right to cultivate the land for agricultural purposes. The project has only begun this year, so the process of rehabilitation is not yet complete. However, the farmer strongly stated his preference that rights to this grazing land should remain with the households who previously held agricultural land use rights. He distinguished this land from collective pasture on the basis that it has already been under the management of identifiable, individual households for many years.

The farmer told us that degradation of village grazing land has been an increasingly serious problem in recent years. However, he attributed degradation not to collective management, but to failure to establish and enforce stocking limits on the land. Both collective and alpine pastures have been adversely affected by increases in herd sizes in recent years.

Man-made pastures in Heping Village

In Heping, household pastures were allocated based on household population as part of the implementation of the Household Responsibility System reforms in 1982. An average allocation was approximately one mu. These parcels have remained under individual household management without readjustment since that time, and in 1999, the village issued land use rights certificates that granted households 30-year use rights to the land. As in Jidi, household plots are used only for growing feed grass, not for grazing.

* Chinese currency, in 2002 USD 1 = 8.27 RMB

Alpine pastures within the village are accessible to all members of the administrative village. However, recent reforms have changed the nature of use and management of collective pastures in parts of the administrative village. The natural village in which we conducted fieldwork possesses approximately 600 mu of collective pasture, which is used by 33 households. Prior to 1999, all of the collective pasture was managed collectively, with access granted to all members of the natural village. In 1999 however, as part of the government's grassland improvement project, the natural village created a 'man-made' pasture by enclosing approximately 200 mu of collective pasture. Within the enclosed area, plots were allocated to households on a per capita basis and demarcated by digging shallow trenches with a tractor. Each per capita share was approximately one mu in size, with the location of each household's specific plot of man-made pasture determined by drawing lots. Similar to household pastures, the man-made pastures are exclusively for the purpose of growing feed grass, not for grazing animals. Households are permitted to grow whatever types of feed grass they choose within the enclosure. The objective of fencing in this area was to provide individual households with incentives to increase grass production through investments, such as fertiliser, that would not be made by households on collectively managed pasture. The costs related to enclosure – fencing materials, labour, demarcation of plots – amounted to 60,000 RMB and were granted by government funds rather than village revenues.

The remaining 400 mu of collective pasture continues to be managed under a common property regime at the natural village level. Grassland guards are employed by the village to prevent access by herders from neighbouring natural villages, and guards are empowered to assess fines of 0.5 RMB per head for every incursion by non-village cattle onto the grazing land. We were told that violations were rare. Herding labour is also organised on a collective basis. Before 2000, the natural village hired a specialised person to perform the herding work and paid him a salary of 3,000 RMB per season, collected from village households based on the number of animals owned. In recent years, however, village incomes have dropped by an average of 80% as a result of the prohibition on timber harvesting. Therefore, the natural village has adopted a labour-sharing approach to herding, under which each household is required to provide one day of herding labour for every two head of livestock it owns. The natural village cadre and farmers agreed that the previous method involved much lower management costs, freed up labour for non-agricultural employment in the nearby township, and better conserved grassland resources. The drop in village income, however, made the financial cost of continuing this type of management prohibitive.

Cadres and farmers agreed that, thus far, the man-made pastures have been largely successful. They estimated that grass production has been nearly twice as much on the man-made pastures as on natural pastures, and over the past two winters, they have noticed a slight decrease in the number of livestock deaths attributable to a lack of feed during winter months. However, cadres and farmers were also in agreement that it would be impossible to allocate all collective pastures to individual households. Several reasons were cited. First, farmers would not welcome such a drastic change from what has been a longstanding traditional practice. Second, farmers would be unable to cover the costs of enclosure without substantial government subsidies, and farmers and cadres agreed that higher priority uses for such subsidies could be easily found. Third and perhaps most important, even if enclosure were entirely subsidised by the government, farmers lack even the minimal amount of capital necessary to

increase grass production on additional individualised pasture. In fact, we were told that some households are unable to afford inputs for their small plot of existing man-made pasture. Without such investments, the net effect would be to limit each household's livestock mobility to a small area without providing for regenerative investments, with severe degradation the only possible result.

Differences between arable land and non-arable land

Over the course of our interviews, we asked county officials, village cadres, and farmers to compare land tenure arrangements on arable land with land tenure arrangements on grassland and to describe the characteristics of each type of land that might necessitate different approaches to land tenure. Table 1 summarises their responses.

Table 1: Comparisons of three land tenure arrangements by farmers, county officials, and village cadres

Arable Land	Grassland
<ul style="list-style-type: none"> • For most villages and communities in mountain areas, it plays both subsistence and income roles, and thus is a type of social security; in farmers' words, it has a production function • Households with larger populations and less land face more pressure • Households receive annual benefits from labour and other inputs • Harvest rights belong to farmers • Most households attach importance to labour inputs and are able to arrange them rationally • They are located around villages and communities and are easy to manage • Limitations and risks are few; the primary issues are good seed and capability of farm households • The tax burden is low; however, there are many fees 	<ul style="list-style-type: none"> • To some degree, it plays both ecological and production roles; for households, the production function is superior to the ecological function; for the whole community and the government, the ecological function is superior to the production function • Pasture degeneration becomes a problem • Enclosure is one of the important criteria that demarcate individualised holdings, but households generally lack the capital to cover costs of enclosure • Farm households benefit mainly from <u>products</u>, rather than from forage grass itself; therefore, grassland tenure is only one of the factors that affect income, and thus is not valued by villagers • Grassland has traditionally been managed as common property • Allocation of alpine pastures is difficult • Allocation to households will result in disputes • Changes in livestock-raising methods, and reductions in number of livestock, are needed

Conclusions and recommendations

Conclusions

The results of our fieldwork in Yunnan Province, as well as a review of the international comparative examples described above, support the following conclusions related to non-arable land tenure arrangements in China.

1. To varying degrees, common property resource management exists on grassland in all of the fieldwork villages – All alpine pasture continues to be managed as common property, and experiments with individualisation of a portion of collective pasture are in very early stages. Only household pasture, which is used for production of feed grasses and not for grazing, has been allocated to all village households on an equal basis in some villages.

2. Both local officials and farmers expressed strong support for common property resource management on some or all of their community's grassland – Where common property management systems are employed, we found very little support for the idea of individualising grassland resources.
3. In many contexts, cadres and farmers felt that common property management arrangements on grassland have been equally or more successful than household contracting on such land with respect to important policy goals – Farmers universally agreed that household contracting is necessary to provide incentives for agricultural production on arable land. In Zhongdian County, herders dismissed individualisation of alpine pastures as impossible and voiced opposition to the idea of allocating all collective pasture to households on the grounds that it would disrupt traditional management methods and increase inter-household disputes, while not necessarily improving grass quality. In areas where grassland degradation had occurred, interviewees attributed it to overstocking, rather than to problems with common property tenure and management arrangements.
4. Local cadres and farmers told us that property rights regimes for arable land and non-arable land must reflect the unique characteristics of these different resources – Fieldwork interviewees told us that this arises not only from the inherent differences between the two types of resources, but also from the yields and products produced on each type of land. They felt strongly that arable land can be contracted to households and that a term of 30 years is sufficient.
5. Additional field research will be necessary to determine the range of land tenure arrangements currently employed on grassland throughout China, their ability to meet central and local policy objectives, and opportunities for community-based institutionalisation of such arrangements – Effective laws and policies governing grassland must be based on adequate and reliable empirical evidence. Our fieldwork findings clearly illustrate that a 'one-size-fits-all' approach, based on arable land tenure policies, ignores both the unique characteristics of grassland, and the diversity of tenure arrangements that have been adapted to those characteristics. Additional research would be helpful in identifying the most successful of such arrangements and distilling a set of appropriate principles and corresponding practical approaches.
6. The national legal and policy framework for grassland should provide for increased local flexibility in designing and implementing land tenure arrangements for grassland based on unique local circumstances and preferences, including common property resource management approaches – The persistence of common property management regimes on grassland in substantial areas of China is an expression of the need to develop tenure and management arrangements suited to particular local circumstances. Rather than trying to fit local circumstances within a narrow legal and policy framework, legislators and policymakers should consciously recognise and validate successful local innovations, including a variety of resource management systems based on or including elements of common property management.

Legal and policy recommendations

Recommendation 1: Formulation of central government laws and policies governing non-arable land tenure should permit a variety of common property management systems, in addition to household management, in order to account for a broad range of factors not addressed in current laws and policies.

Both our fieldwork findings and a variety of scholarly research on non-arable land tenure arrangements point to many factors that must be considered in formulating laws and policies that institutionalise such arrangements. The presence or absence of these factors, as well as their relative impact on policy success, may vary substantially even at the village level, making legislative flexibility and local participation in the process of determining appropriate tenure arrangements crucial aspects of their success.

Although the extent of our fieldwork in Zhongdian County was limited, covering only three villages, cadres and herders detailed a number of factors underlying local grassland tenure arrangements. Traditional common property management practices, based on long-standing cultural preferences among Tibetan and Yi minorities, remain an important underpinning for local grassland tenure. These preferences remain particularly strong for alpine pastures, and to some extent for collective pastures. Aside from these cultural preferences, local herders also pointed to a number of practical factors that have contributed to an inability to institutionalise individualised household tenure for grassland in Zhongdian. A primary obstacle identified by herders was the inability of households to effectively manage, or even assert rights to, the pasture currently under collective management, given both the area of land involved and the remoteness of alpine pastures. A second factor was the expense involved in effectively demarcating and enclosing individualised pastures. Both cadres and herders emphasised that they would be unable to bear the financial burden associated with fencing, meaning that any individualisation effort would require substantial government subsidies or outside sponsorship.

Generalisation of our fieldwork findings – from a few villages in Zhongdian to all of China – is difficult. However, our findings from Zhongdian clearly demonstrate that the unique geographic, cultural, and economic circumstances present in any particular area where grassland is an important resource may strongly favour common property management systems over individualised household tenure. Therefore, the checklist of issues presented below focuses on issues that must be addressed in order to effectively institutionalise tenure arrangements for grassland in China.

For grassland, we would reiterate what we have said above concerning forestland. The ultimate determinants of tenure arrangements for grassland need to be made by local actors, in light of local circumstances, developing appropriate policy responses within a broad framework established at the national level.

Rights to common property resources must be carefully and clearly defined and allocated for the system to achieve its potential benefits (Giovarelli and Hanstad 1999). Issues to be considered include the following. Who has access to the common resource? What formula will be used to determine appropriations? Who has authority to appropriate and regulate use? And, what methods will be used to calculate and

enforce appropriations regulations (Bromley and Cerna 1989, de Haan et. al. 1997)? A number of experts agree upon a primary list of design principles, useful in addressing these issues and establishing an efficient and sustainable system of common property resource management. These design principles are as follows.

- a) Balanced national policies – Policy choices regarding resource appropriation must accommodate a variety of potentially competing economic and social objectives at issue in different production systems and agricultural zones (Steinfeld et. al. 1999). Compromises or trade-offs may be required where national or central government objectives regarding the environment conflict with local, social, or economic realities. In order to effectively govern resource management, policies at the state or central government level must provide specific guidelines, funding, and authority to lower-level institutions regarding policy implementation.
- b) Local authority systems – Implementation of grazing policies requires efficient institutional management to establish clear rights of access to land, monitor for environmentally sound land use, facilitate appropriate involvement in land management, and settle disputes (Steinfeld et. al. 1999). Many experts agree that institutional management, if not ownership, should be reduced to the lowest reasonable level, especially when central governments lack extensive direct outreach and presence, because enforcement of management regulations and effective assessment of resource variability requires site-specific animal tallies and land audits (Steinfeld et. al. 1999). Furthermore, localised institutions tend to be adaptable to social norms and behaviours and more responsive to the economic needs of the communities they govern. Local-level institutions are better able to harness local knowledge and foster a sense of responsibility for identifying problems and finding solutions at the local level (Steinfeld et. al. 1999).

Pastoralist organisations, or peasant enterprises, are able to establish units of resource allocation and utilise authority systems, which are often culturally predefined. These institutions, designed by resource users, limit state or central government management costs over the long term and minimise defiance to regulations formulated externally (Bromley and Cerna 1989).

The unification of resource use and maintenance under one localised management agency creates a potentially self-policing system, in which all users regard resource degradation as detrimental to their own interests. For example, in several Swiss communities, the list of fines and overdue payments is read at the meetings in order to allow community members to apply pressure to non-conforming users (Bromley and Cerna 1989).

- c) Clear legal access rights to the resource – Legal rules governing access to common property resources must provide user groups with exclusive rights to their allocated portion of the resource in order to minimise damaging, unrestrained competition among resource users. Exclusivity should be structured around identified ownership or management groups with membership in the group and the boundaries of the resource clearly delineated (Bromley and Cerna 1989). Allocation of use rights within these groups must also be clearly

delineated based upon such factors as individual holdings or seasonal grazing requirements (Stevenson 1991). Grazing rights within defined communities should vary equally among individual grazers as seasonal variations in available forage mandate. In many cases, a legal system of rights valuation determines the number of rights, based on forage availability, necessary to graze a particular type of animal (for example, 2 rights = 1 cow or 3 sheep, Stevenson 1991).

- d) Audits of land condition and community behaviour – Rules establishing active monitoring of the resource can enable appropriators to determine the seasonal capacity and distribution of lands allocated for grazing purposes (Steinfeld et. al. 1997). Site-specific monitoring also facilitates the assessment of fines and fees based on discrepancies between land use regulations and actual community action. Calculation of stocking rates, dates of resource use, and the specific location of resource extraction are vital to regulation enforcement and are made possible through constant monitoring. Frequent inventories of the resource also allow funding for resource maintenance to be targeted more appropriately toward degraded land. Existing administrative institutional capacity must, however, be carefully considered in developing the rules governing such a monitoring system.
- e) Participation in rule-making processes – The involvement of resource users, or community members, in determining resource management rules enables lower-level institutions to efficiently implement upper-level policies (Bromley and Cerna 1989). By synthesising resource user knowledge with national policies governing resource management, lower-level institutions increase the likelihood that appropriation regulations are suitable and will be followed.
- f) Rapid, low-cost dispute resolution – Rapid, low-cost dispute resolution is necessary in the regulation of pastureland, because harmful competition for the resource is inevitable when immediate enforcement of access rights and use regulations is lacking. Dispute resolution costs must remain low, because expensive settlement costs can preclude enforcement of regulations by lower-income resource users. Disputes must be settled rapidly, because the fragility of marginal grazing lands makes them readily susceptible to damage, jeopardising the future of users with small holdings.

Lower-level institutions can facilitate rapid, low-cost dispute resolution, based on the proximity of the administrative body and the familiarity of local officials with local customs (Bromley and Cerna 1989). The number of disputes can diminish if the regulations formed at the local level more accurately reflect customary interactions. Increased accountability in local institutions can provide a self-policing mechanism, in which resource users actively pressure those in violation of land use regulations into conformity (Stevenson 1991).

- g) Management tools, including fines and sanctions, fees and taxes, and other mechanisms – Legal rules allowing graduated fines and sanctions to be imposed by appropriators, or officials accountable to appropriators, provide a necessary economic deterrent to the grazing of animals in excess of allotted grazing rights (Stevenson 1991). Fines assessed at the local level enable assessors to tailor sanctions or fine amounts according to site-specific damage. Additive fines and

sanctions can provide an effective deterrent mechanism, if the economic incentive to violate regulations decreases with the extent of the violation, and the true cost of grievous violations to the resource is reflected in the growth of the fine (Stevenson 1991). Fines or other penalties must simultaneously be substantial enough to be painful to the violator but not so severe that they lack credibility.

Use fees or land taxes are often necessary to provide for the basic infrastructure of land management and can potentially be used as a tool in deterring the addition of animals to the common resource. Fees are typically based on the number of animals grazed or the number of grazing rights held. In order to work as a tool to limit overgrazing, fees must be structured so that they deter a herder from placing too many animals on the land. One method could be to increase the fee per head for every additional animal.

In cash-poor economies, work duties or other methods of direct resource maintenance can replace fees or taxes (Stevenson 1991). These methods commonly calculate a number of hours of maintenance required of each resource user, based upon either the number of animals grazed or simply by virtue of resource use (Stevenson 1991). Utilising the labour of resource users in maintenance of the resource may be more cost-efficient than funnelling money through management agencies and may potentially instil a greater sense of stewardship among resource users.

Recommendation 2: Forthcoming laws addressing rural land tenure should explicitly allow for local variations with respect to forestland and grassland tenure.

As noted above, China is currently in the process of drafting or revising two laws with great potential to impact non-arable land tenure arrangements. These laws should be drafted in a manner that explicitly allows local governments and communities to develop and implement land tenure arrangements for forestland and grassland resources that are both consistent with national policy objectives and tailored to unique local circumstances. Specific recommendations concerning each law are described below.

The Property Law – China's forthcoming Property Law will establish a broad set of principles applying to all forms of rural land use rights. The published 'Expert Version' draft of the Property Law makes clear that laws, rather than land use rights contracts, ultimately prescribe the nature of land use rights. As such, the body of laws governing agricultural land use rights must address a series of issues that define the common characteristics of agricultural land use rights. It is crucial, however, that drafters of the Property Law recognise that it may be appropriate to vary the specific characteristics of agricultural land use rights depending on the type of land.

Providing a clear and uniform statement of the characteristics of arable land and wasteland, while simultaneously allowing a more flexible approach to grassland and forestland, could be achieved by applying all provisions of the Property Law uniformly with respect to arable land and wasteland, but only presumptively to grassland and forestland. This could be accomplished by clarifying current Article 231 of the Expert

Draft, pertaining to the establishment of agricultural land use rights. Article 231 simply states that, 'Agricultural land use rights shall be established on all types of land used for agricultural purposes.' To allow for flexibility in non-arable land tenure arrangements, a second sentence should be added to Article 231 that reads as follows. 'Land use rights to cropland, forestland, grassland, wasteland, and land used for aquaculture shall be subject to the provisions of this chapter and all laws concerning each category of agricultural land.' Such a revision to Article 231, when combined with current Article 235 of the Expert Draft, which enables possession of agricultural land use rights by 'households or a number of individuals,' would provide the broad legislative framework necessary to enable more detailed legislation on non-arable land tenure arrangements involving common property management.

The Rural Land Contracting Law – Within the broad framework to be established by the Property Law, the forthcoming Rural Land Contracting Law, China's first law devoted specifically to the issue of rural land rights, will also play an important role in providing flexibility in non-arable land tenure arrangements. A draft version of the Law received its first reading by the National People's Congress on June 26, 2001. Media reports related to the draft indicate that it will require contracting of all forms of rural land, including forestland and grassland, to individual households for a use term of 30 years or longer.

In light of the findings detailed above, we recommend that two separate provisions, one addressing forestland and one addressing grassland, be added to the Law. These provisions should state as follows.

'Rights to forestland [grassland] may be contracted to units other than households for common or joint operation and management, where local conditions have been deemed appropriate and the relevant administrative units of the People's government at the county level or higher have adopted local regulations concerning such contracting arrangements. Such local regulations shall be consistent with the principles of this law and any Implementing Regulations issued pursuant to this law.'

The combined legal impact of these provisions – The inclusion of these general enabling provisions in China's forthcoming laws on rural land rights would not ultimately resolve the complicated series of issues China still faces with respect to non-arable land, nor would it undercut household contracting as the fundamental principle of non-arable land tenure in China. It would, however, have at least two significant and immediate impacts on non-arable tenure. First, it would legally sanction and recognise existing forestland and grassland tenure regimes based on indigenous knowledge or local adaptation that, while perhaps not consistent with existing national laws and policies, may be extremely effective in meeting the myriad goals that underlie those laws and policies. Second, it would require local actors themselves to adopt regulations, consistent with the principles embodied in national laws and policies, to govern forestland and grassland tenure. Through such a process, the voices of local actors and innovators could be woven into the broader fabric of a set of national laws and policies to create a flexible but consistent governing framework.

By contrast, the adoption of the Property Law and the Rural Land Contracting Law based solely on a system of household contracting, and without any such provisions enabling local variations, would have a number of important negative results. The most

drastic impact would be that all existing forms of forestland and grassland management not based on household contracting, including many successful local approaches, would be placed clearly outside the scope of Chinese law. These areas would be forced to choose between two options. The first option would involve abolition of the current tenure arrangements and implementation of household contracting of forestland and grassland. Our fieldwork in Yunnan indicates that such a process would likely conflict with the values and preferences of local farmers and herders in many parts of China, and may result in less effective resource management. A second option would be to continue management of forestland and grassland under existing tenure arrangements. This would inevitably complicate existing legal uncertainty concerning the management of such land, result in increased land disputes, and undermine attempts to introduce the rule of law in rural areas.

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Resource Tenure Models for Rangeland Improvements



Resource Tenure Models for Rangeland Improvements

Discussion Paper for Working Group on 'Appropriate Institutional Arrangements and Policies for Community-based Rangeland Management'

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Resource tenure as a basis for rangeland management

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 various resources, such as pasture, water, credit, and labour. Thus, resource tenure becomes a fundamental aspect of effective rangeland management. Given this, a basic understanding of the types of tenure is necessary for the sake of this discussion.

Table 1 summarises the types of tenure that might exist in a given rangeland area. 'Tenure' at its most basic level simply means a bundle of rights to control and access a particular resource or set of resources (Gilmour and Fisher 1991). Tenure is not merely ownership, as is commonly believed. Tenure can be legal or informal (and therefore sometimes technically illegal), public or private, common or individual. It involves those entities who make decisions and those who get the benefits from the resources, and thus implies a dynamic process of negotiation. There are two points we wish to make from this comparison. First, use of a particular rangeland pasture by a group of herders does not imply open access (or uncontrolled grazing). Many indigenous systems of communal management exist and operate effectively throughout the region. Second, many types of tenure can operate simultaneously in the same area. If newly introduced rangeland management schemes do not compliment tenure systems previously in place – for example, state-driven policies that individualise control of pastureland in an area previously managed communally – they are very likely to fail.

Table 1: The types of tenure* that might exist in rangeland areas of the Tibetan Plateau (Richard 2002)

Formal (de jure or legal)	Informal (de facto – may or may not be sanctioned by the State)
<u>State</u> – land 'owned' by the government	(State control may not be recognised locally)
<u>Individual</u> – legal control by individual through lease or ownership	<u>Individual</u> – access by customary norm or rule
<u>Common property</u> – formalised through committees or cooperatives and sanctioned by the State	<u>Common property</u> – informal group norms and rules for control and access which may or may not be governed by local committees
(Open access not recognised legally by the State)	<u>Open access</u> – no rules or norms for access

* tenure = rights to control and access resources

Case study: the eastern Tibetan plateau

With this brief framework on the complexities of resource tenure, the question is raised as to whether fencing is the answer for improving rangelands of the Tibetan Plateau. As previously discussed elsewhere in this workshop (Richard, Volume 1, Chapter 1), Tibetan Plateau landscapes are heterogeneous in terms of water and forage availability, they are naturally low in productivity, and the vast majority of the local population still depends on diverse subsistence livelihood strategies.

The government of China, citing the success of Deng Xiao Peng's reforms of the early 1980s (specifically the Individual Household Responsibility System in cropping areas), formulated the Grassland Law in the mid-1980s and has since been implementing it throughout western China (Thwaites et al. 1998, Williams 1996, Wu 1997, Richard 2002, Banks et al. 2003). However, implementation is proving to be difficult in non-arable lands (Schwarzwalder et al. this volume), especially in remote, socially and environmentally marginal landscapes such as the Tibetan Plateau.

The Chinese government offers sound rationale to justify these policies, such as difficulty in providing nomads with social services like education and health care, and heavy snowfalls that have historically led to livestock losses (Wu and Richard 1999). The Chinese government felt that fencing could help provide reserve pastures during these critical periods. However, underlying this theory is the belief that pastoral migratory practices are destructive, despite overwhelming evidence to the contrary. Those locally mandated to implement such standardised policies are often at the mercy of higher-level decision-makers; thus, there is poor local representation in the grassland allocation process (Yan et al, 2003). There are also issues related to spatial and temporal heterogeneity of pasture resources and the unsuitability of allocation, in regards to fair distribution of resources to individual households. These factors become significantly more pronounced as the environment becomes more marginal, rendering such policies ineffective at the local level.

Hypothetical resource tenure-management models

Figure 1 shows three simplified models of land allocation and management to illustrate how the Grassland Law could conceivably be implemented, and the current and potential impacts given three scenarios: local autonomous control, strict enforcement of Individual Household Responsibility, and a co-management model that brings together indigenous and scientific strategies and allows for more flexible policy interpretations and adjustments. These representations reflect actual situations and are based on research conducted by partner organisations of the International Centre for Integrated Mountain Development (ICIMOD). The models are simplified for the sake of this discussion.

Government-driven model

As an example of a government-driven situation, a pilot programme has been established by the Sichuan Animal Husbandry Bureau in Hongyuan County, Sichuan Province, as a demonstration site for livestock and pasture development programmes. Here, families have been forced to settle on individual allotments for year-round use and household management (Yan et al. 2003). Although some positive outcomes have arisen from this strict implementation of the Grassland Law (where contracts are allocated to individual households and management is conducted by the household), such as reduced overall labour demand for households and increased survivability of

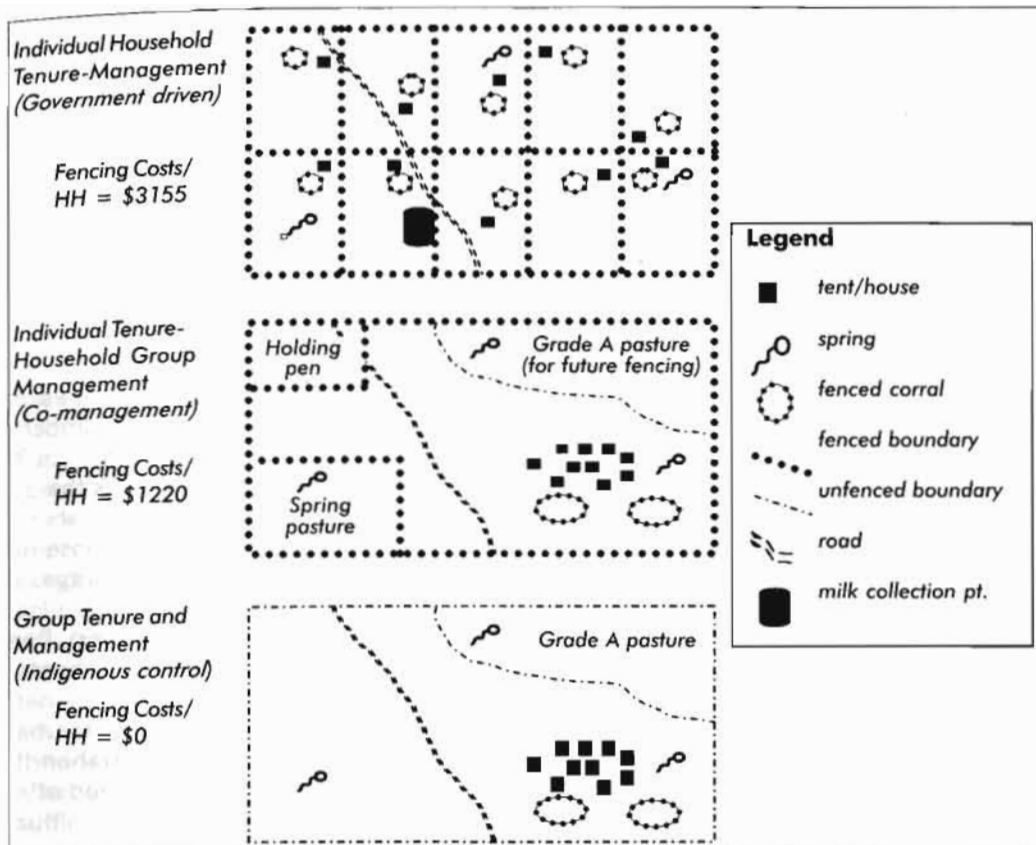


Figure 1: Hypothetical comparisons of tenure and management arrangements for the eastern Tibetan plateau. The area of each large box represents the total pasture area (ha) required for ten households (HH), each with 300 sheep equivalent units (SEU)¹, on a total of 1600 ha of land. Fencing costs are calculated based on the price of 7 RMB/metre (just under US\$1) for fence. Adapted from Richard (2003).

herds in the winter, researchers have noted several disadvantages to such an approach. One is that fencing costs per household are often prohibitive without heavy government subsidies. According to the model illustrated in Figure 1, each household must pay US\$3,155 to fence their 160 allotted hectares. In several documented cases, allotment to individuals has restricted access of many households to water sources, forcing them to travel long distances to riparian areas (Yan et al. 2003). This has led to increased bank erosion along water courses due to concentration of livestock at watering sites. In addition, Hongyuan County has been designated a milk production zone, and this has had a dramatic impact on herd distribution. As a result, most families wish to keep their lactating herds near the road and milk collection points, renting tent sites and pastures from those who were allocated roadside allotments for up to ten months per year, sending only unproductive animals to the more remote summer pastures. Here, impacts of overgrazing have become quite severe along the roadside (Yan et al. 2003). These studies have also noted significant social impacts, including increasing conflicts due to poor allocation of pastures,

¹ One adult sheep or goat equals one SEU; 10 sheep = one horse; 5 sheep = one yak.

widening gender gaps, and reduced access to schooling for children. These findings are more thoroughly summarised in Richard (2002).

Co-management model

In Maqu County, south-western Gansu Province, many families have also been legally allocated individual winter pastures and manage them at an individual level, and they express varying degrees of satisfaction with the allocation process and outcomes (Yan et al. 2003, Zhao et al. this volume). However, this county has allowed groups of up to ten households to pool their pastures and fence the outer boundary, an example of the co-management model seen in Figure 1 (individual tenure, household group management). Benefits, as perceived by the pastoralists themselves, include lower fencing costs, estimated in the illustrated model to be only \$1,220 per household. In addition, herders continue to realise economies of scale with respect to herding, as households take turns supplying labour for supervision of the joint herd. The number of livestock that each household can graze is calculated based primarily on the number of people in the household and secondarily on the number of livestock the household possesses. Households that graze fewer livestock than the hypothetical carrying capacities of their portions of the joint pasture are compensated by those households that graze more. Poor households are thus guaranteed access to forage equivalent to that produced by their share of pasture, and they can earn supplementary income in the form of resource access 'rents' (Banks et al. 2003). Due to production policy declaring Maqu County a meat and butter producing zone, herds are more evenly distributed across the landscape than in Hongyuan County, regardless of tenure arrangement, because butter and meat are more durable commercial livestock products than milk and do not require livestock concentration near product collection points. (These products can be carried to market instead of collected near the site of production.)

Many pastoral communities in these counties, and indeed throughout much of the Tibetan plateau, are currently managing pastures communally – with legal rights given to 'administrative villages', administrative units comprised of many smaller 'natural villages' or herding groups, but not officially contracted under current law. Naqu County in the northern Tibetan Autonomous Region (TAR) is an example of a co-management approach under this tenure-management scenario, in which resource rights are appropriated at the village level, and management is collective. Here, the government has established a number of fattening pastures that have been, or will be, formally contracted to the village (either administrative or natural). Feedlot locations were selected through consultation with communities at the natural and administrative village levels, and fences were constructed where they serve to protect wetland functions (particularly in marshlands) and facilitate rapid growth response. Rules for use of the collective pastures, including stocking rates and timing of grazing, have been set by village governments and vary among sites, with criteria including household labour contribution and number of livestock per household. Once the formal grassland contracting process begins, households may choose to take individual winter allotments or to combine land access rights at the group or natural village levels, provided that they decide to do this prior to the land division process. Use rights per family would be calculated depending upon household population (70%) and livestock number (30%). For these collective agreements, the county has established a use tax of 0.05 RMB/day for each SEU. This 'grazing fee' will be collected by the village or group leader and redistributed among member households within the village or group, based on the access rights formula above.

Local autonomous control

Despite claims of the government that the majority of grasslands have been contracted to households (Banks et al. 2003, Schwarzwald et al. this volume), the vast majority of pastoral communities on the Tibetan Plateau still access their pasture lands based on historic use rights. Most communities collectively herd animals and move as groups. They have simply 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 obvious advantage to this approach is that fencing costs are nil (see indigenous model, Figure 1). However, disadvantages include higher labour requirements and greater potential for encroachment by outside communities without effective legal recourse.

Figure 2 summarises the comparative strengths and weaknesses of the above three resource tenure-management models. Table 2 expands on Figure 2 and presents a more detailed description of costs and benefits associated with rangeland improvements under these various tenure regimes. These actual and hypothetical examples show that when communities are given the choice, they will often choose collective arrangements, because they are in keeping with customary practice, and they are more affordable. Even in cases where allotments have legally been granted, actual use and management practice follows a more customary pattern of group tenure and management, functioning in a 'de facto' manner. Given these comparative advantages, 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 (Richard 2002).

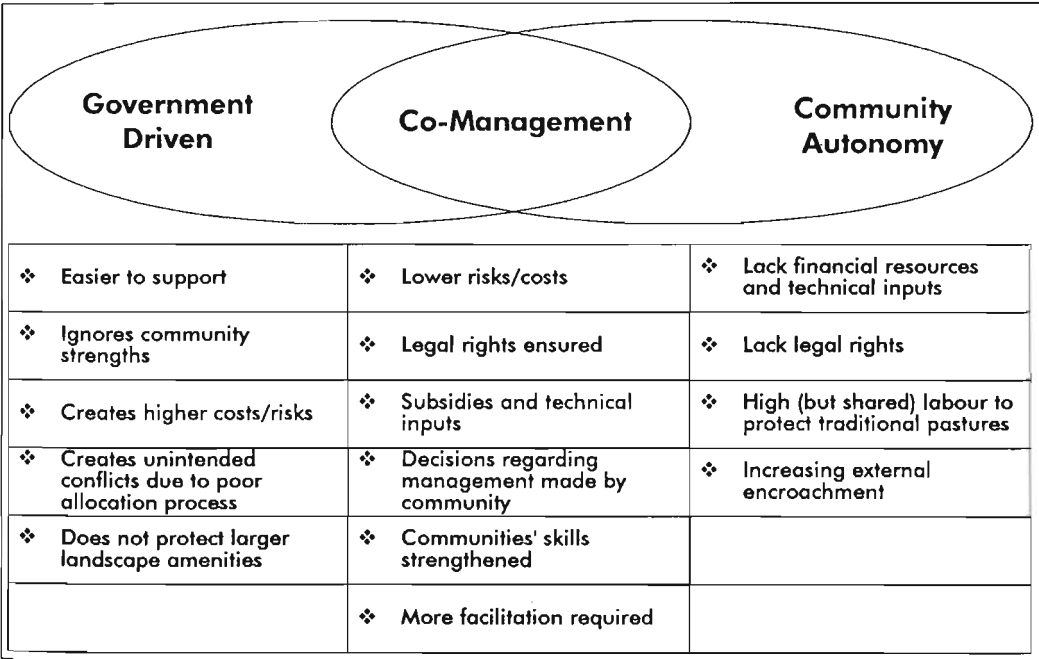


Figure 2: A comparison of hypothetical policy implementation models for resource tenure-management arrangements and their relative strengths and weaknesses

Table 2: Rangeland improvements under different tenure systems

Common Property	Individual
Advantages	Advantages
<ul style="list-style-type: none"> • Can maintain mobility for pasture/grazing • Equity/potentially sustainable • Lower risks and labour sharing • Easy management • Reduced cost per household • Spreads risk among community through collective action 	<ul style="list-style-type: none"> • Easier to acquire credit for improvements • Easier to deliver services (such as veterinary, marketing, and seed) • Tenure more secure under situations of conflict and instability
Disadvantages	Disadvantages
<ul style="list-style-type: none"> • More difficult to get credit • Potential conflicts without strong leadership • Possibly lead to open access without cohesive community • More negotiations and conflict management required • More difficult with high population • Requires more facilitation 	<ul style="list-style-type: none"> • High cost to individual household • Can lead to potential conflicts when land not adequate for existing herds • Reduces flexibility during dry years • Can lead to reduced plant diversity • Potentially not economically viable

Potential tenure-management arrangements under new policies

Recent revisions of legislation affecting pasture allocation in China inherently allow flexibility in interpretation, although this is not apparent when one speaks to those mandated to implement them, reflecting a lack of understanding of policy (Yan et al. 2003). Although vague, China's newly revised Rural Land Contracting Law (adopted 2002) allows for some degree of collective tenure and management. Specifically, "Contracting parties may voluntarily join their land contracting and operation rights as stock shares for the purpose of engaging in cooperative agricultural production." This is illustrated by Naqu County's future plan for contracting to groups of herding households. This gives households the security to access resources but also allows them to engage in collective management arrangements.

Table 3 highlights a variety of tenure-management arrangements that are potentially possible, as long as future policy guidelines allow for local interpretations of policy that match site-specific conditions. Such arrangements range from individual household contracts where land is individually managed (well suited to cropping and hay-lands) to large-scale collective arrangements for the protection and management of landscape amenities such as riparian zones or watersheds. The latter case would involve formation of cooperatives of contract holders (individual, household group, or village level) that enter into management agreements for protection of ecosystem-level amenities, which to date has not been promoted in policy.

Conclusions

Across the globe, social capital in the form of common property regimes (CPRs) and collective management arrangements has been shown to be effective and sustainable, especially with the right supportive environment (Fisher 2002). Although not perfect, CPRs tend to be biodiversity friendly because resource demands are diverse. They reflect indigenous systems of management, and are thus more acceptable and

Table 3: A typology of potential tenure and management combinations for pastures and rangeland landscapes under the new rural land contracting and grassland policies. Adapted from Richard (2003)

		MANAGEMENT ARRANGEMENTS (de jure or de facto)		
TENURE (legal contracts)		Household	Household group	Collective of contract holders
	Household	<ul style="list-style-type: none"> ➤ Grassland contract with individual household ➤ Management by individual household ➤ Benefits accrued at household level <p><i>Example: Hongyuan County, Sichuan – see Figure 1</i></p>	<ul style="list-style-type: none"> ➤ Grassland contract with individual household ➤ Management by household group ➤ Benefits accrued at household level <p><i>Example: Maqu County – see Figure 1</i></p>	<ul style="list-style-type: none"> ➤ Grassland contract with individual household ➤ Cooperative of individual contract holders for pasture or landscape management ➤ Benefits accrued at household level
	Household group		<ul style="list-style-type: none"> ➤ Grassland contract with household group ➤ Management by group ➤ Benefits based on household and livestock numbers 	<ul style="list-style-type: none"> ➤ Grassland contract with household group ➤ Pasture or landscape management by cooperative of household groups ➤ Benefits based on household and livestock numbers
	Collective (village level or larger)			<ul style="list-style-type: none"> ➤ Grassland contract with village (no internal land division) ➤ Management by village or collective of villages ➤ Benefits based on household and livestock numbers <p><i>Example: Naqu County, TAR</i></p>

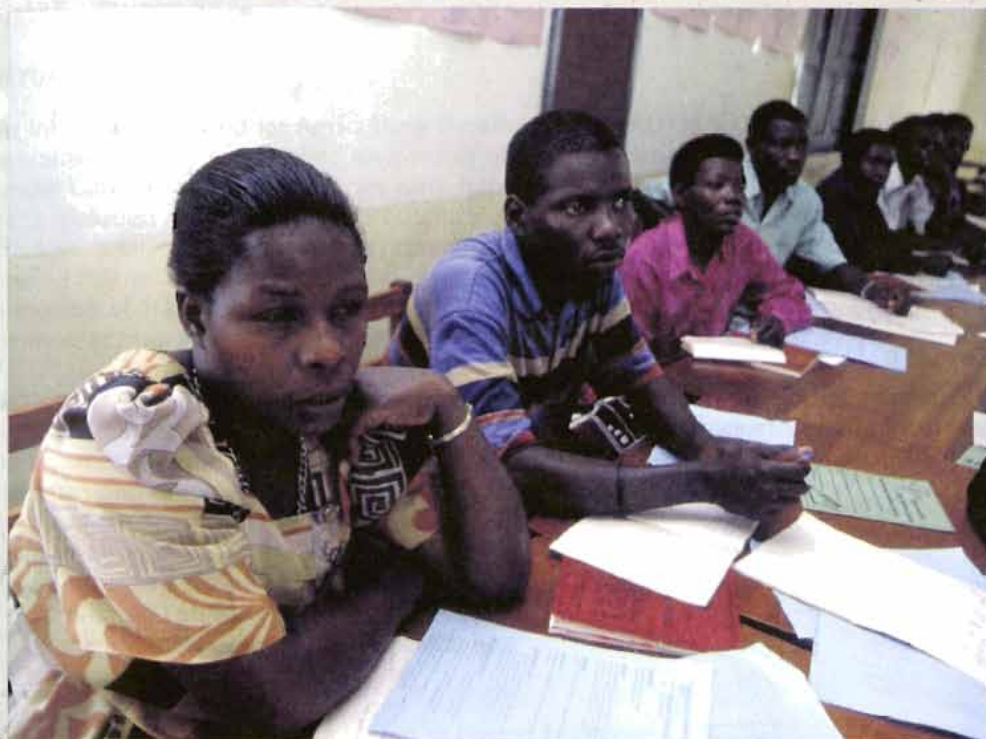
adaptable. Collective agreements help to foster coalitions for management of larger landscape values (biodiversity and watershed amenities). They tend to be more equitable than private tenure arrangements, and thus contribute more toward poverty alleviation. And in the long-term, they reduce the cost (in terms of both money and labour) for individual households, thus reducing socioeconomic risk. We are working in stressful environments where collective action has been the cultural norm for centuries as an adaptive response; we should build on these local strengths and enhance them through legitimate tenure and management arrangements that reflect local aspirations, skills, and environments. The fast disappearing knowledge base of pastoral communities can potentially be a valuable asset for developing technological and institutional innovations in pastoral development and rangeland conservation, provided that those who work with pastoral people know how to tap into this rich source of wisdom and promote it.

A co-management approach – an approach that embraces diversity and melding of knowledge systems to create sustainable and appropriate management models, and that promotes flexibility in programming – is needed to work in these diverse cultural and ecological landscapes. A long-term strategy is needed 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.

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IFAD's Experience in Supporting Community-based Livestock and Rangeland Development



Cover Photo: Extension workers attending a functional adult literacy training course in Hoima, Uganda (*from the presentation by Ahmed Sidahmed, photo Rhadhika Chalasani*)

IFAD's Experience in Supporting Community-based Livestock and Rangeland Development

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Introduction

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. Several things were happening at the start of IFAD operations. These included a dramatic drop in donors' support of livestock development activities, a sharp increase in the number of grazing animals available to meet growing human demand (enhanced by policies supporting supplemental feeding), and an erosion of traditional community management practices in state property or common access areas.

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 improved access to productive resources and empowerment. IFAD's values are:

- client satisfaction,
- innovation,
- creating and sharing of knowledge,
- working and sharing with others,
- efficiency, effectiveness, and impact, and
- transparency and accountability

IFAD's strategic objectives are shown in Figure 1.

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.

IFAD supports pastoral communities through the following activities:

- identifying their problems and needs;
- communicating their interests and requirements to local authorities, project designers, and donors;
- exchanging and adopting information about innovations and appropriate rangeland management technologies;
- accessing, managing, and coordinating credit, revolving funds, water points, and grazing areas.

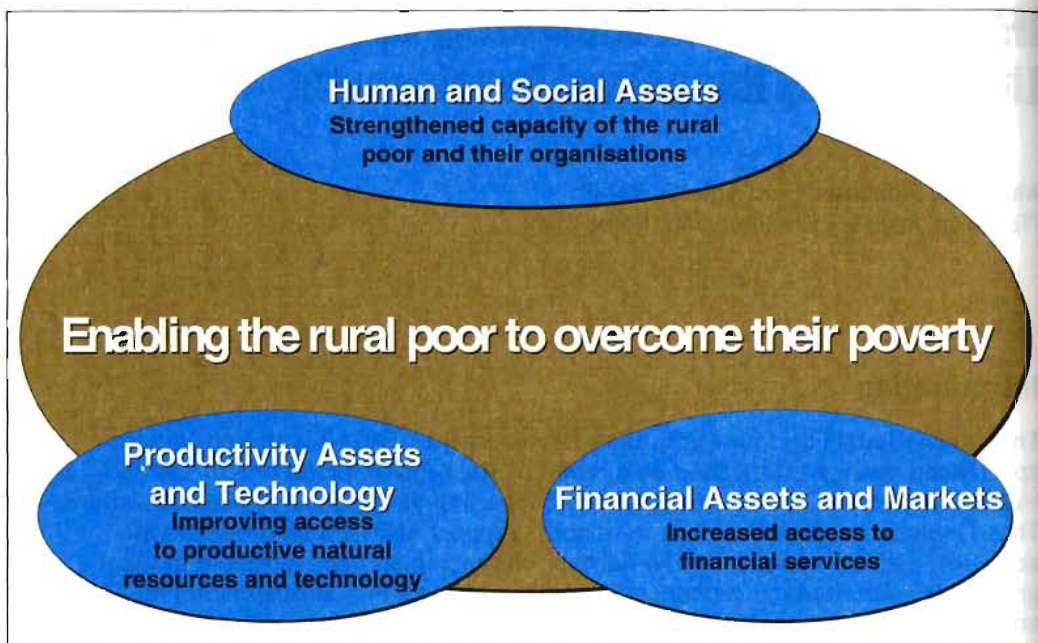


Figure 1: IFAD's mission is to enable the rural poor to overcome their poverty through equitable access to the means of empowerment (capacity building), natural resources, technology, rural finance, and markets.

IFAD has funded 578 projects in 115 countries, for a total of US \$7,288 million in loans and grant operations. For every dollar contributed by IFAD, two dollars were contributed in matched funds by the national and international communities. Between 1978 and 1998, IFAD supported more than 200 projects with livestock components, directly benefiting 73 million people from 13 million rural households. Between 1994 and 1998, IFAD committed loans valued at US \$497 million for dry-land projects. The majority of IFAD's rangeland projects are in sub-Saharan Africa, the Near East or North Africa, and Central Asia.

Rangelands, pastoralists, and issues

"Rangelands are lands on which the native vegetation – predominantly grasses, grass-like plants, forage, or shrubs – is suitable for use by grazing or browsing" (Society for Range Management website). Rangelands encompass approximately half of Earth's land surface. Due to insufficient and unreliable rainfall, rangelands cannot maintain cropping activities. Therefore, rangeland use is predominantly by livestock (Figures 2 and 3). Grazing is the most efficient way to convert cheap primary production into valuable animal products.

Some pastoralists derive immense wealth from raising large herds and flocks. However, most are among the world's poorest, living in marginal and fragile areas typically characterised by extreme weather conditions, low rainfall, rough terrain, high altitudes, and poor soils; as well as poor access to roads, markets, and services. Most rangeland ecosystems are subject to overuse, intensified by sharp increases in human and livestock populations.



IFAD/L. Dematteis

Figure 2: Cattle grazing in the People's Republic of China



IFAD/T. Rath

Figure 3: Sheep and shepherd in Mongolia

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. In fact, almost 70% of global rangelands are considered degraded (UNEP 1998).

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. And 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.

Evolution of IFAD support

IFAD began with production-oriented sub-sectoral projects, such as: 1) directing the building of public institutions in Ethiopia and Kenya; 2) delivering services and transferring technologies to pastoralists through formal institutions, such as the National Animal Health Project in Kenya; and 3) providing water and feed services to livestock moving from rangelands to markets, such as on the stock route in Sudan, where water-yards were established over 2,000 km. However, IFAD's methods of support have since changed to multi-sectoral community-based programmes. These 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, as in Sudan and Morocco.

These more advanced IFAD projects have sought integrated solutions to social, economic, and technical constraints and have formulated and enforced supportive policies and reform measures. Some of these projects created more stable environments for sustainable rangeland use through creation of community-based grassland management units (GMUs), for example, in Qinghai and Hainan, China. They helped build community institutions through training and financing in Morocco. They promoted rangeland rehabilitation by encouraging favourable policies, strategies, and laws, which assured equitable use and judicial resource management in Jordan and China. And they redistributed livestock to assure social equity and judicial management of rangeland resources in Mongolia.

In one project located in semi-arid steppe rangeland in Morocco, 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. These cooperatives were able to create two-year reserves on a once-degraded area of 450,000 hectares. Herders are now willing to pay a grazing fee to

the cooperatives and are willing to use the reserves according to a strict schedule. Herders and concerned authorities have also started a dialogue that will allow the cooperatives to become increasingly self-reliant.

IFAD has also supported the development and enforcement of legislation providing pastoralists with legal rights to equitable and environmentally sustainable rangeland use. For example, laws enforcing an incremental tax on larger herd sizes were part of the measures established by IFAD projects in China, Mongolia, Azerbaijan, and Georgia. This reduced overgrazing and allowed poor smallholders access to common grazing resources. An IFAD investment project in Mongolia also allowed for collection of an incremental tax on range use. In addition, it allowed for negotiation with the government on development of policies for the even distribution of livestock. Projects in Mongolia and China have promoted measures prohibiting livestock concentration around human population centres.

Lessons learned

Over the course of these development projects, IFAD has learned several valuable lessons.

- A project in China taught us that fencing may save fenced pastures but put extra pressure on communal pastures, and thus on poorer herders who are more dependent on open range resources.
- Many projects have showed us that destocking is very difficult to implement without strong incentives to households such as price policies or use rights, or legislation such as community-supported rangeland laws.
- A project supporting camelid producers in the Andes of Latin America showed us that training of pastoral communities should be comprehensive and include technology transfer, product processing, and marketing aspects.
- Projects in Morocco, China, and the Sudan demonstrated that appropriate land tenure legislation is crucial to range management.
- We learned that the power of traditional hierarchies should not be underestimated.
- During a project in Morocco, we learned that the role of the beneficiaries should outweigh the role of the state in organisation and implementation of rangeland development programmes.
- Many projects have demonstrated that targeting the poorest requires careful design of project activities, as associations tend to be dominated by richer members, and institutions are reluctant to provide credit where they see a greater risk of default.
- Finally, we learned that coordination, monitoring, and information flow are crucial to sustainable management of rangeland resources

Resulting changes

After learning the above lessons, IFAD's new rangeland development programme is participatory; range users themselves are the focal points for development, and their coping mechanisms are the benchmarks (cover photo). It is less supportive of public

institutions and intensively supportive of self-management and self-reliance on the part of rural communities. It searches for equitable solutions, establishing enabling frameworks to allow the communities most affected by environmental destruction to take a leading role in identifying and implementing possible solutions. It supports user-based community organisations, such as herders' associations, rangeland users' associations, and livestock water management groups. It also supports effective harmonisation and complementarity of institutional, political, legal, and technical factors.

Complementary institutional roles

Institutions at both the community and state levels play crucial roles in making our development projects work.

Pastoral community institutions

Institutions at the community level are in the best position to assure full participation and benefit of all categories of herders, including the poorest as well as the richest. They also formulate resource management action plans, participate in negotiating the plans with policy makers, and ensure their implementation. They participate in the process of identification and management of financial and other services. They facilitate environmental awareness and negotiate movement of pastoralists. They resolve conflicts at the most basic level and preserve collective land use rights.

State and formal institutions

State and other government institutions also play many important roles. They ensure provision of minimum services and funds. They define and ensure the overall legal and judicial frameworks for lower-level institutions. They supervise security and equity issues and ensure the democratic and political framework necessary for institution building. They provide support and advice to the pastoral institutions, as well as the information and tools needed for risk aversion and emergency preparedness. They negotiate with other states, agreements and modalities concerning international livestock movement and they are the parties of last resort in conflict resolution and implementation of regulations.

The future of rangelands

The above-mentioned experiences made 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, minimisation risk, and the preservation of diversity. Such development must also recognise the complexity of the social, economic, and natural factors involved (Figure 4).

A community planning approach to the development of pastoralists fosters integration between different actors, such as communities, local and national institutions, and policy makers (Figure 5). 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.

The implementation process for this approach is illustrated in Figure 6.

PASTORALISTS

Empowerment Tools

Legislation	Social Changes	COMMUNITY ASSOCIATIONS	Poverty Targeting	Gender Issues
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Access to

FINANCIAL SERVICES	<ul style="list-style-type: none"> Credit: <ul style="list-style-type: none"> In case (RFs) In kind 	<ul style="list-style-type: none"> Banking 	
INFRASTRUCTURE	<ul style="list-style-type: none"> Markets 	<ul style="list-style-type: none"> Roads (e.g., feeder roads) 	
VETERINARY SERVICES	<ul style="list-style-type: none"> Veterinarians or paraveterinarians 	<ul style="list-style-type: none"> Sustainable drug supply and distribution (RDFs) 	<ul style="list-style-type: none"> Vaccination services: <ul style="list-style-type: none"> National In kind
TECHNOLOGY, TRAINING AND EXTENSION	<ul style="list-style-type: none"> Animal husbandry Contingency plans and early warning systems: <ul style="list-style-type: none"> Natural disasters (e.g. droughts) Man-made disasters (e.g. wars) 	<ul style="list-style-type: none"> Animal health Range management: <ul style="list-style-type: none"> Controlled grazing Improvement (resting, seeding, fertiliser) De/restocking 	<ul style="list-style-type: none"> Breed improvement
GRAZING AREAS	<ul style="list-style-type: none"> Use rights 	<ul style="list-style-type: none"> Cohabitation with cultivators (supplementary feeding) 	
INPUT SUPPLY	<ul style="list-style-type: none"> Livestock (e.g., cattle banks) 	<ul style="list-style-type: none"> Livestock watering points 	<ul style="list-style-type: none"> Feed and mineral supplements

Figure 4: IFAD's multi-faceted approach to the empowerment of rangeland users

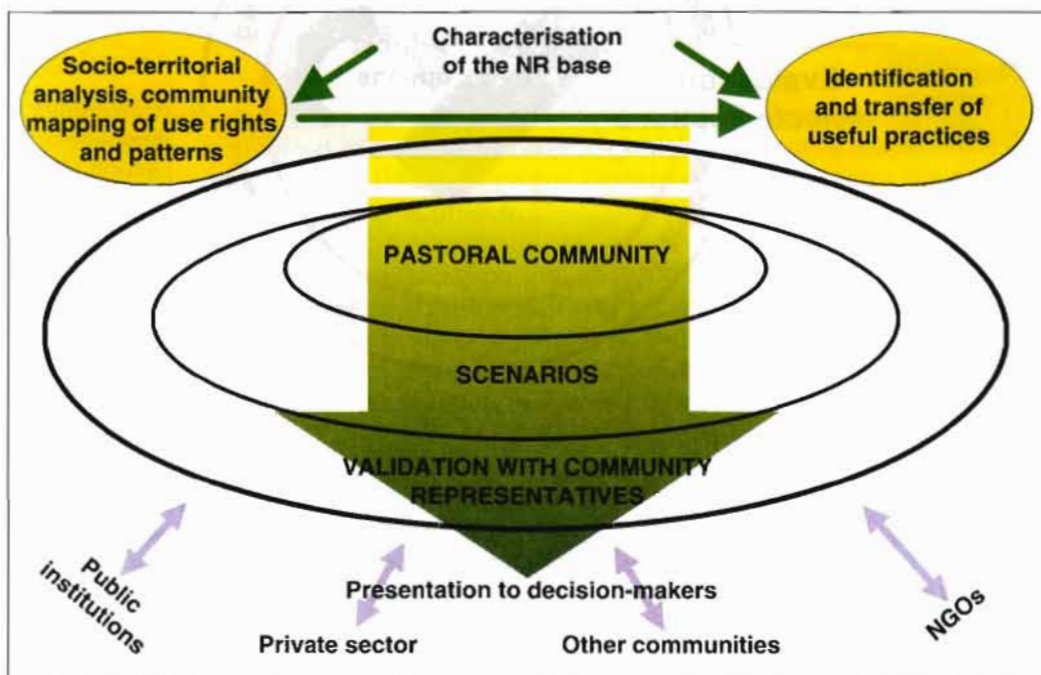


Figure 5: Community approach: strategy and methods (IFAD 2001)

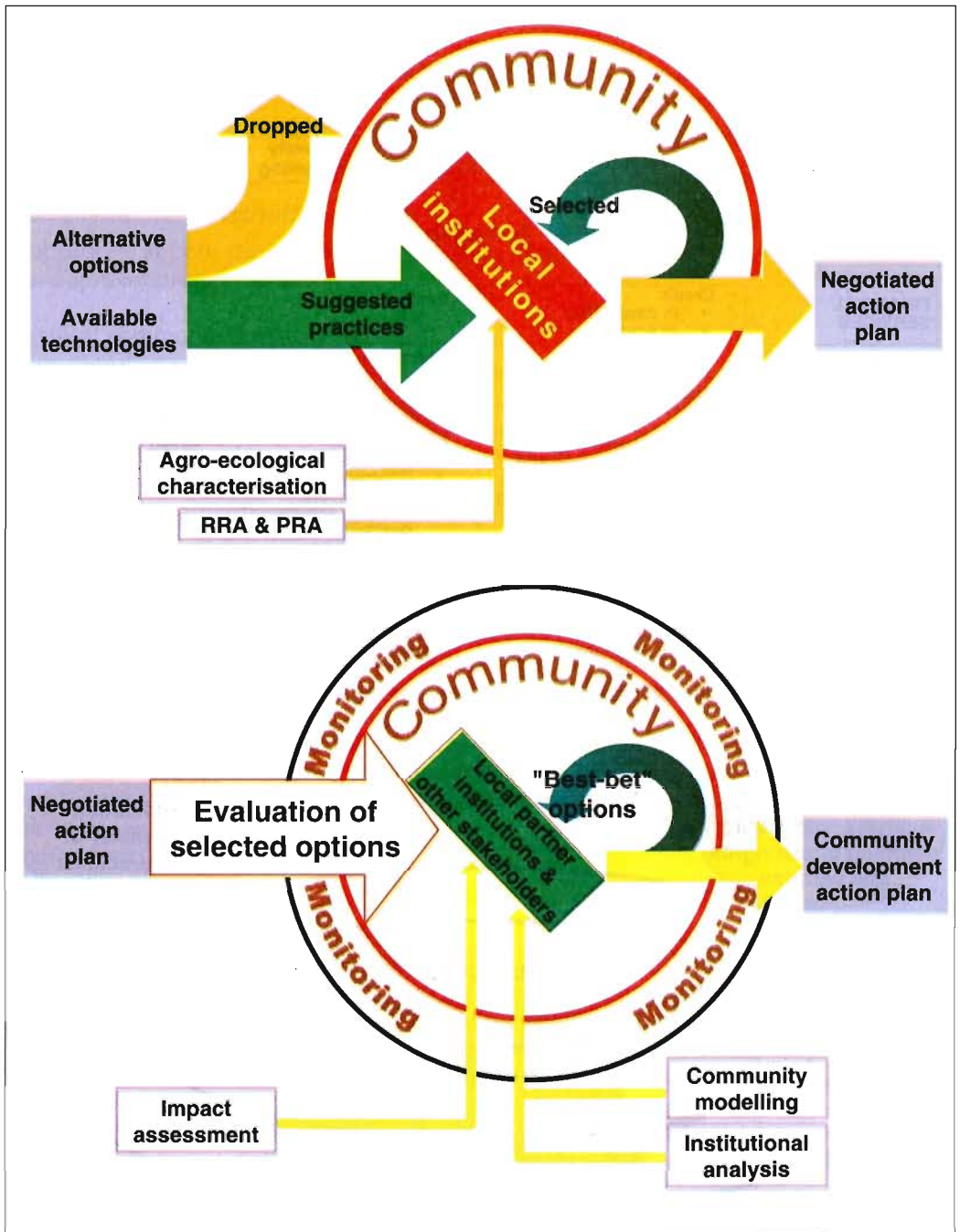


Figure 6: The implementation process for IFAD's community approach, including an early assessment and negotiation phase, and an evaluation phase (IFAD 2001)

The community mapping and planning approach

The approach being adopted in IFAD's newest agro-pastoral development programmes features the following three principles.

- The integration principle recognises the interaction between different activities taking place within a given area, in a holistic manner and in harmony with the ecosystem and with traditional systems. Before being disrupted by the state, these interactions were always considered and recognised in traditional systems.
- The territory principle recognises the diversity, complexity, and dynamics of local situations. It is therefore necessary to adapt solutions appropriate to the specific environment of each territory.
- The partnership principle recognises the roles, importance, and necessity of training the public authorities and local development actors within an overall framework.

The community mapping and planning approach was applied to the Agro-pastoral Development Programme for the Southeast, in Tunisia. The goal of this programme was to promote range management organisations for design and implementation. Three steps were taken.

- Community-based organisations, identified as socio-territorial units (STUs), were established and made collectively responsible for the management of territory, based on acceptable traditional and contemporary practices.
- These STUs created community development plans based upon a long-term land development programme.
- The government established a multidisciplinary team to advise the community groups in programming, methodological support, and management training for group members.

Conclusions

- IFAD projects start at the community and household level. This allows for the design of unprejudiced or sanctioned projects, which can be up-scaled in other communities and regions. IFAD's rangeland development programmes are not based on a static formula or approach.
- IFAD benefits from a close association with pastoralists and their institutions, as well as from a very broad partnership with civil society organisations; national, regional, and international research institutions; and donors. This allows for an evolutionary appreciation of pastoralists' needs, institutions, structures, and strategies and has improved through the years the efficacy and sustainability of our interventions.
- IFAD's experience in supporting rangeland users offers useful models for others interested in large-scale interventions.
- Some of our experiences gained and lessons learned are available online on the IFAD website under the Livestock and Rangeland Knowledgebase (LRKB) Web-page (described in Working Group 1 on the LRKB).

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How Much Participation? Experiences with Participatory Approaches in Pastoral Settings



How Much Participation? Experiences with Participatory Approaches in Pastoral Settings

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Introduction

Rangeland management has always been a difficult chapter in the story of development cooperation. Rangelands occupy about half the earth's 'useful' land surface. Rangeland science has a history of six or seven decades. However, it took a long time to recognise that there are no universally applicable models for development in rangeland areas. As pointed out by Niamir-Fuller (1999a), there is also no definition of rangelands that is accepted worldwide.

In recent years, there has been a growing interest of governments and development agencies in participatory approaches for rangeland management and pastoral development. In this paper, we want to:

- show how the analysis of pastoral systems gradually gave rise to participatory approaches to pastoral development;
- report on a review of participatory approaches in pastoral development;
- look into experiences with participatory monitoring and evaluation (PM&E) in pastoral development projects;
- indicate where participatory approaches to pastoral development may fit or not fit.

Analysis of pastoral systems

Development projects involving interventions in rangelands commenced about 40 years ago. In the 1960s and early 1970s, the emphasis was on technology transfer (Turk 1999) in order to increase production for urban and international markets. The approach was one of capital-intensive and labour-extensive ranching, with range rehabilitation and improvement schemes, water-point development, and fodder production (Niamir-Fuller 1999a) all largely based on American experiences.

In the 1970s, it became increasingly clear that, for ecological, economic, and institutional reasons, the ranching approach could not be transferred to other regions. Analysis of the failures of ranching projects revealed that the existing pastoral systems had been poorly understood. A period of intensive studies of pastoralism began, particularly in Africa (Galaty et al 1981, Sandford 1983, Galaty & Johnson 1990). Some important fora for publication of case studies and intensive discussions on pastoralism were the Pastoral Development Network, which operated from 1976 to 1995; the journal *Nomadic Peoples*; *Parcours Demail* (the journal of the French network *Parcours*); and various rangeland journals.

The studies of pastoral production and livelihood systems revealed the following.

- A high level of efficiency in resource use among many traditional pastoralists. For example, it was calculated that pastoralists' livestock in the Sahel of West Africa produce two to three times as much protein as do livestock kept under ranching conditions in areas with similar natural conditions in semi-arid parts of Australia and the USA (Breman & de Wit 1983). Studies in other parts of the world brought similar findings.
- The inadequacy of conventional ecological theory. Conventional rangeland science and management is largely based on the theory of succession, which says that removal of grazing pressure allows the vegetation to revert to a 'climax' vegetation community. According to this theory, the art of range management is to stabilise the vegetation at a desired stage. More recent ecological research has shown that in drylands, particularly where annual plants predominate, vegetation yield and composition depends much more on rainfall than on previous grazing pressure. As rainfall varies greatly between years, so does vegetation production. Under such conditions, range vegetation is not in direct 'equilibrium' with grazing pressure (Ellis & Swift 1988, Behnke et al 1993, Scoones 1994). In the long run, however, grazing management can influence vegetation composition even in drylands, particularly with respect to the balance between woody and herbaceous species.

Management of rangelands in dryland regions can be 'opportunistic' or 'holistic', or even both. 'Opportunistic' rangeland managers take advantage of different natural resources when these are available, and when there is little feed and water, try to get by or move to other pastures. Movements can never be entirely opportunistic, as land-use rights and international and national borders must be respected. Furthermore, better-endowed areas, which used to be part of rangelands for at least seasonal use, are increasingly taken up by other land-users. Niamir-Fuller (1999b) recently reviewed different forms of managing mobility in Africa.

'Holistic' rangeland managers see resources more from a systems perspective. They move and react with appropriate management when vegetation is adversely affected by grazing (Le Gall 1999). However, despite its name, this approach often refers to management of particular sites but not the entire area of rangeland.

- The richness of indigenous pastoral knowledge. Generations of pastoralists have used particular rangelands over centuries and have acquired substantial knowledge of the details of their environment, such as its plants and their potential usefulness or feed quality, as well as how to manage animals, pastures, and water (cf. Niamir 1990).
- The multiple functions of rangelands. Different stakeholders may also have quite different perceptions of the functions – and therefore the problems – of rangelands. Rangelands can be seen as potential carbon sinks (Lusigi & Acquay 1999); as vast, sparsely populated areas and locations for water catchment, plant biodiversity, or wildlife refuge; as sources of so-called minor products, such as special mushrooms or resins; as potential tourist areas; and not only as pasture for domestic animals.

- The threats to sustainable pastoralism from policies based on a paradigm of sedentary land use. Policies that do not take into account the particularities of pastoral land use easily undermine existing pastoral systems. Such policies include feed subsidies that are designed to increase production and land-use policies that favour cropping, disregarding the facts that 1) irrigated crops in arid areas need large amounts of water, 2) rain-fed farming frequently suffers crop failure, and 3) ploughing of land can speed up erosion.

Non-appropriate policies are particularly evident in policymakers' efforts to deal with drought and drought mitigation. Successful pastoralists have developed coping strategies, such as building up large herds that can survive shocks, moving their herds seasonally or in an opportunistic manner, entering into agreements with crop farmers in better-endowed areas, practising appropriate livestock marketing strategies, and/or diversifying into trading and transport. The apparent increase in frequency of drought is not so much a meteorological phenomenon, but is linked to a more intensive utilisation of grazing resources and to an erosion of traditional strategies to cope with environmental variability, making the impact of drought more severe. In recent years, scientific knowledge with respect to early-warning systems before drought, food aid during drought, and restocking after drought has increased significantly, but governments and donor agencies still include provision of subsidised or free feed and at times even transport of water during crisis periods. These measures invite overstocking and aggravate the effects of drought, as well as increasing their apparent frequency.

As important as the results were on a theoretical level, pastoral system studies proved to be tedious, data-intensive, and time-consuming. In most cases, final results become available only years after fieldwork, or data could not be analysed at all in a meaningful way and ended up in 'data cemeteries'. Furthermore, the dynamics of pastoral systems limit the usefulness of an intensive systems study at any one time, particularly if it cannot give useful guidance to pastoral management. However, these studies did reveal the severe limitations of a top-down approach to pastoral development and indicated the need for alternative approaches.

The rise of participatory approaches in pastoral development

Participatory approaches to development have been tried for a long time in isolated projects or by various non-government organisations (NGOs), but they did not become mainstream until the early 1990s. As the results of participatory approaches became more widely known, they quickly became popular – to the extent of being a fad – among government and intergovernmental agencies, including the World Bank, and in larger bilateral and multilateral development projects. In the case of pastoral areas, this applied to both 'developing' and 'developed' countries (e.g. Australia and New Zealand). As interest grew, the need for training also grew, since many development workers had great sympathy for participatory approaches but did not have clear role models. A strong line of developing participatory approaches can be traced back to the movement and network of rapid rural appraisal (RRA), which after some self-reflection, developed into participatory rural appraisal (PRA). Some training manuals that emerged during this decade of participation (referring to general development rather than specifically to pastoral development) include Pretty et al. (1995) and Veldhuizen et al. (1997).

As with many new concepts that become fashionable, there was soon a confusion in terminology. This was especially so in pastoral development, as most of the official project planners are people who do not have a pastoral background and often regard sedentary life-styles as superior. Some government officials, obviously unwilling to change, defined participatory projects as those which they planned and in which pastoralists were expected to participate by doing what they were told to do. Others thought that participation consisted of pastoralists giving information to outsiders, who then planned projects for them. Some development workers entered into joint planning and implementation, involving those who also contributed to the project with labour or other inputs. Still others thought that participation meant asking pastoralists to pay for things that had been decided in a top-down manner.

The proponents of PRA – which, by this time, had developed further into participatory learning and action (PLA) – therefore saw the need to classify participatory approaches (Pretty et al 1995). This follows a line of growing involvement, responsibility, and ownership of project measures by local people, parallel to diminishing decision-making power by government officials and project staff.

With reference to pastoral development projects, such a classification could be the following, with participation increasing down the list.

- 1) Participation by way of pastoralists' refusal to take part in a project because they regard it as inappropriate.
- 2) Participation by pastoralists providing information to project planners; this could help to avoid inappropriate projects, although it is the outsiders who determine what is done with the information.
- 3) Participation of pastoralists in interpreting data and in planning projects.
- 4) Participation of pastoralists by contributing free labour, material inputs, and money to jointly agreed upon projects.
- 5) Joint decision making and implementation of projects and joint learning by pastoralists and outsiders.
- 6) Projects controlled entirely by pastoralists, who request advice from outsiders if and when needed.

The last-mentioned stage has been reached by some livestock producers in Australia, New Zealand, and the USA, who request and pay for advice from outsiders. What we personally regard as real participation starts with joint interpretation of data and planning of projects, but the aim should be joint decision making and implementation, including investment by the pastoralists themselves in the project or programme.

Participatory situation analysis and planning with pastoralists

In 1993, the German Agency for Technical Cooperation (GTZ) commissioned a review of experiences with participatory approaches in pastoral settings, with a focus on Africa (Waters-Bayer & Bayer 1994). In the more than 100 reports (much of which were 'grey literature') that could be gathered, not only from Africa but also from other parts of the world, we found at that time that the following.

- Experience with participatory approaches was largely restricted to the stage of situation analysis. Only a few sources reported joint planning and implementing of projects. This is not surprising, since participatory approaches to development

became mainstream only in the early 1990s and focused on RRA/PRA for situation analysis.

- Development workers and government officials on one hand, and pastoralists on the other hand, often defined key problems differently. Whereas development workers were concerned about environmental degradation, pasture weed encroachment, or weaknesses in the institutional set-up for pasture management, pastoralists were more concerned about human health, education, marketing possibilities, or communication in rural areas.
- Data collected was predominantly qualitative or semi-quantitative and indicated general trends – such as in environmental quality – but not precise figures – such as degree of decline in soil cover over the last 20 years.
- A variety of RRA/PRA methods were used in pastoral settings; including semi-structured interviews, transect walks, historical matrices, mapping, proportional piling, and SWOT analyses. However, there was no point in trying to standardise these tools; creativity in their application was required.
- The use of participatory methods mobilised community enthusiasm but also created high expectations. After pastoralists had invested their time and energy in various situation-analysis and planning exercises, disappointment was great when projects were delayed in starting or did not start at all.
- Participatory approaches require a change in the roles of the actors in the development process. Scientists and development workers must cease being investigators, instructors, or benefactors and must develop into process moderators and communicators. Pastoralists then would no longer be regarded as objects of research, target groups, or beneficiaries; instead, they would become active partners in development

Since this review was conducted, participatory research and development approaches have been more widely applied, including beyond the stage of situation analysis. However, the change in roles and the creation of a conducive environment for participatory approaches have been very slow processes. Problems are encountered in seemingly small but decisive points, such as accounting procedures. Large organisations, especially, are not very flexible. For development banks, the flexibility required for participatory development, and the often small amounts of money required to stimulate but not to buy participation, are hurdles that are very difficult to clear.

PM&E with pastoralists

Discussions in development circles give a relatively short half-life to fashionable topics, although topics that have gone out of fashion may come back again 15 or 20 years later with a new generation. In the last couple of years, new issues have come up, such as globalisation, biodiversity, and international conflict management. Some development professionals have already hoped that participation was 'out', making way for new issues to take the forefront.

We hope that this is not the case, as we see participation as a key to sustainable development. Fortunately, some people in GTZ have a similar view and commissioned a follow-up review of participatory approaches in pastoral development, this time focused on PM&E. A draft of the review has been completed, and the final version is now available (Bayer and Waters-Bayer 2002).

On account of the wide spread of electronic media since we made the 1994 review, we could tap a much wider radius of experience fairly quickly this time. Nevertheless, far fewer cases could be found that had been sufficiently documented to be included in such a review, even though our own experiences in visiting and discussing projects had suggested that considerable progress had been made. In many cases, achievements are being under-reported, possibly because practical project work is of much higher priority to the actors involved than is documenting the process.

Much of what has been documented about M&E in pastoral settings is not what we would consider to be participatory. Participatory M&E and participatory evaluation differ from conventional M&E and conventional evaluation, in that the main aims of the participatory approach are:

- to strengthen the capacity of project partners – especially the local people – to reflect, analyse, and take action;
- to increase project accountability to partners, 'beneficiaries', managers, and donors;
- to derive lessons that can help correct shortcomings in actions and structure of project partners and can improve project implementation.

Conventional evaluations focus on the third point, but are normally not viewed as a contribution to local institution building, which is a key point in participatory evaluation.

Some of the main findings of the review of PM&E in pastoral settings were as follow.

- Although M&E systems set up by projects of some major international donors increasingly contain participatory elements, NGOs are at the forefront in developing PM&E approaches designed to strengthen local capacities.
- The most common activities/topics to which PM&E or participatory evaluation is applied are: water development, community-based veterinary services, local institutional development (community and area development committees), platforms for conflict management, and participatory experimentation. There are few examples of PM&E of broad-based vegetation/environmental trends or management, or of animal husbandry and breeding. Even in the case of livestock markets, where we had expected some interest in PM&E, little evidence of its existence could be found.
- The main tools used in PM&E were the same as those used in situation analysis and project planning, already described in the 1994 review.
- For a systematic PM&E, the most important questions to be asked (but which are not always asked) are as follow.
 - Who needs the information? If the information that projects want to collect is not important for the local people, is PM&E appropriate?
 - How precise does the information collected need to be?
 - Who participates? Only older men, only sedentary people within easy reach? Also women, youths, and mobile pastoralists?
 - Are all important stakeholders involved in PM&E activities?
 - Is there any hidden agenda that is influencing the process and results of PM&E, such as expectations for an increase in outside assistance?
 - What are the costs – in terms of time, energy, and money – for the various participants in PM&E, and is it worth it?

A participatory mid-term evaluation of a pastoral development project is described in Box 1. Such an exercise is not cheap, particularly if external evaluators are involved, and can also be quite demanding on the time of all participating stakeholders. Nevertheless, at least the project staff and local pastoralists that had been most directly involved felt that it was a useful learning experience (Pantuliano 1998).

Not only the pastoralists directly involved, but also other local resource users, project staff, development agency staff, and donors are among the stakeholders in a pastoral development project. The experience described in Figure 1 led to the conclusion that PM&E cannot provide all the information needed by the different stakeholders. Conventional and participatory M&E are not antagonists. Data requirements of different stakeholders can differ substantially. In many instances, a combination of a participatory, largely internal evaluation with a conventional, external evaluation will probably be better than either form of evaluation on its own.

It is important to be aware of the positive and negative aspects of PM&E, and to use this approach only where it is appropriate. A review of experiences with PM&E in pastoral settings is summarised in the SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis given in Table 1.

Where do participatory approaches fit?

Local people normally understand quite well local conditions and processes within their normal experience. 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, and the opportunities and dangers of globalisation, are probably beyond the understanding of most pastoral groups, insofar as they are usually not involved in trans-border marketing. Also, global environmental issues, such as global warming or the conservation of wildlife biodiversity, are usually of little concern to pastoralists, who are likely to be more concerned that wild animals are predating on their livestock or eating valuable grass.

International and national agencies concerned with desertification attach much importance to the monitoring of rangeland. If this is going to be useful to pastoralists, and therefore attract their participation, then there must be an efficient institutional set-up that allows them to make better day-to-day decisions in managing the pasture and water resources, as well as catering to theirs and others concerns in the mid and long term.

A prerequisite for effective participatory planning, implementing, monitoring, and evaluating of rangelands and development projects is a certain degree of institutional maturity among the pastoral communities, so that these institutions can act as and when necessary. Local institutional development is therefore an integral part of participatory development.

A central concept in participatory approaches is subsidiarity: higher levels of organisation take on only those issues that lower levels cannot handle competently. Some practical examples are as follow.

- Individual pastoralists and pastoral groups can normally handle well the day-to-day management of pastures, water, and animals. However, setting the rules is – after consultation with the groups concerned – a local, provincial, or national

Box 1: Participatory evaluation of a development project in a pastoral area of Sudan

Since 1987, the UK-based NGO, Agency for Co-operation and Research in Development (ACORD), has supported an integrated development project among the Beja pastoralists in the Red Sea Hills of eastern Sudan. In recent decades, the Beja have lost many of their animals, mainly as a result of drought, and they have not yet managed to build up their herds again to resume full pastoralism. A project team of Beja people trained in participatory development methods give support to locally-elected village development committees (VDCs), which plan, implement, and monitor development activities. Some of these are partially funded by the project. Activities the VDCs have initiated include goat-restocking schemes, training of community members as paraprofessional veterinarians ('para-vets'), rehabilitation of wells, setting up community stores, or – as many pastoralists have recently turned to fishing – boat repairs.

The Red Sea Hills Programme (RSHP) team and the VDCs proposed terms of reference (ToRs) for the evaluation. These were discussed with ACORD staff in the Khartoum and London offices and were adapted to the needs of the organisation. RSHP members selected to be part of the evaluation team and external evaluators then translated the ToRs into questions to be discussed with the different communities.

At the start of the visit to each community, a meeting was called, during which two community members (one man and one woman) were elected to become part of the evaluation team for that particular community. Also during this meeting, the members of the community selected from among their various project-supported activities the three which the men and the women, respectively, felt were most important to evaluate. Over the next two days, during a series of small meetings with focus groups identified by the local evaluators, achievements and problems with the selected activities were evaluated jointly. The local evaluation team then presented the results in a community meeting, in verbal form and on posters, for discussion by community members.

A final report was compiled by the external evaluators, based on community evaluations and discussions. The RSHP team translated a condensed version of the report into the Beja language to be returned to the communities. In their internal M&E, VDC members started to apply tools that had been used during the participatory evaluation.

During the evaluation, many community members eagerly participated. They raised critical issues; for example, that only a few people were really active in community work; and openly discussed weaknesses, such as in the financial management of community stores. However, the data that came out of the evaluation was largely qualitative. Higher echelons in ACORD had wanted a quantitative assessment of project impact, but this could not be achieved through the participatory evaluation.

The Beja project staff and community members kept the evaluation within their own group and excluded another group of admittedly more affluent pastoralists in the area, the Rashaida, a group that was only marginally involved in the project (water development), but that may have experienced indirect impacts.

In a sparsely populated area like the Red Sea Hills (as is the case in most pastoral areas), the evaluation involved a great deal of travelling between dispersed communities. The process proved to be very time-consuming and costly, compared with the funds available for project implementation.

Sources: Pantuliano 1998, Harnmeijer et al. 1999

Table 1: SWOT analysis of PM&E in pastoral settings

<p>Strengths</p> <ul style="list-style-type: none"> • Use of local indicators that are well understood by community members • Easy to use by the community • Encourages frank, open discussion • More open-ended than other methods; interesting leads can be followed up • Time-efficient • Fun and dynamic • Diversity of opinions become apparent • Decisions for action can arise from consensus of opinion • Immediate feedback to wider community • Increases local ownership of information • Methods are flexible; can be adapted to local experience and conditions • Information easy to collate • Many tools available • Less chance of interviewer bias compared with formal surveys 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Needs careful preparation • Needs good group management skills • Group pressure can suppress divergent opinions • Results can be influenced by local expectations of outside assistance • Courtesy bias: people respond politely rather than frankly • Produces less numerical data than other methods; technicians and donors like to see quantitative data • Results need to be presented with care so that readers not familiar with participatory methods do not misinterpret results • Composition of discussion groups can be biased; people who have much work may be unable to attend
<p>Opportunities</p> <ul style="list-style-type: none"> • Development of monitoring and impact assessment systems that local people can sustain after project ends • Increases participation of community as a whole • Can be used as a management tool • Training in these methods can change attitudes • Methods can be incorporated into routine activities • Methods useful for envisioning and assisting local bodies to plan ahead 	<p>Threats</p> <ul style="list-style-type: none"> • Too much other work to do ; PM&E must be prioritised relative to other project objectives and activities • Natural disasters and insecurity • Operational constraints – logistics • Varying capacities of village/area development committees; some may not yet be ready to use PM&E • Scepticism among officials with respect to the use of participatory methods • Officials' reluctance to give information and decision-making authority to local communities

Source: Catley (1999), adapted

government task. If ecologically sensible pasture management involves crossing an international border, setting the rules may even be an international issue.

- Pastoralists can recognise when an animal is sick and when there is a disease outbreak. They may also be able to treat their animals in many cases. However, declaring quarantine and closing an area to animal movement should be a local or provincial government issue. Setting the rules for quarantine is a national or international issue.

In this spirit, it should be the local people who decide on whether the participation of outsiders is needed to achieve their goals and on the way they conduct their M&E, whether in interaction with outsiders (as in PM&E) or informally in their own way. Likewise, higher echelons of organisation must consider whether they can better reach their goals with or without the support of the local people. Participation – including PM&E – 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

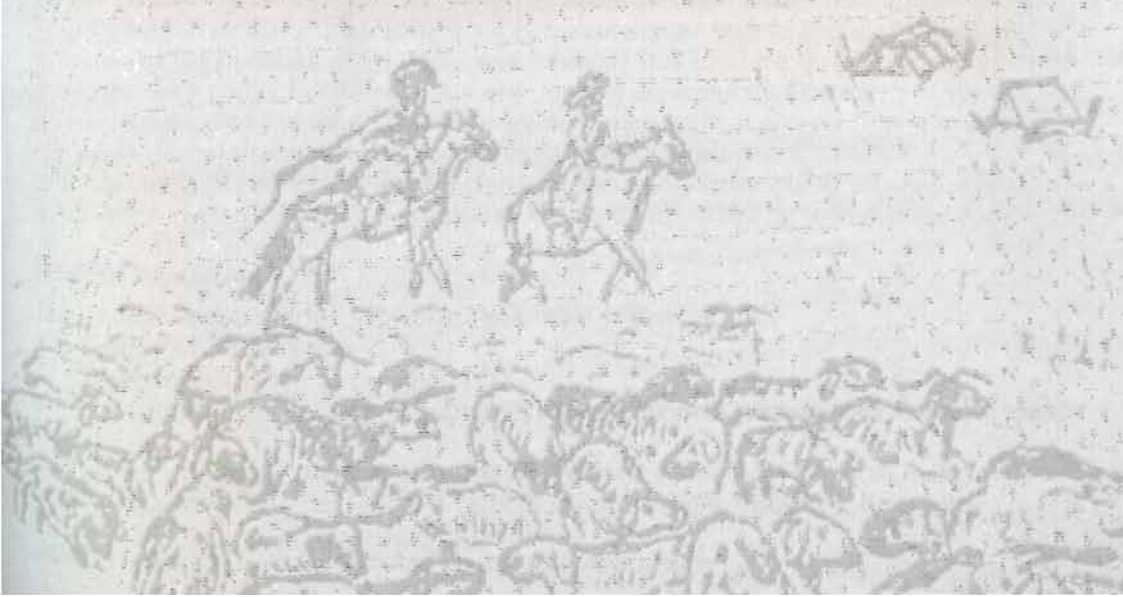
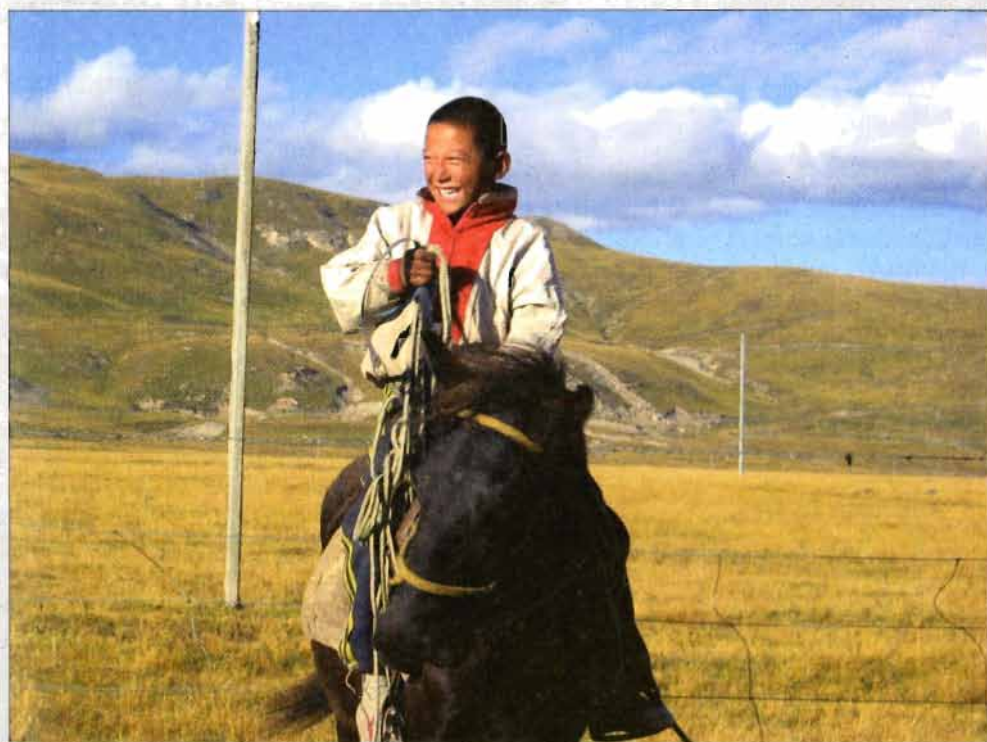
partnership. The processes of building mutual trust, developing local capacities, and strengthening local institutional are slow. PM&E can enhance pastoral communities' capacities to manage their own development, but the PM&E approach has to build on local needs and areas of responsibility. Trying to 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.

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





Cover Photo: A young herder of Maqu (*Camille Richard*)

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

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Background

The region

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 the 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 small mammal and insect infestations. These occurrences have led to an acute decrease in the productivity of the rangeland, exacerbated by a drying climate. As a result, increasing sandiness of the rangeland is detrimentally affecting the life and work of the local people.

Rangeland improvement techniques are recognised as important for pasture development; the major techniques to be promoted include fencing, eradicating small mammals, planting or replanting grass, and applying fertilisers. For sustainable development of pasture, there are several points to consider regarding methods of popularisation of rangeland improvement technical skills. One such point is how to promote herders' participation in the popularisation process – should we reorganise or improve the organisations for self-management and development of herders and strengthen their functions to promote sustainable pasture development? What should be our point of view in gender and women's empowerment issues during the popularisation process? How should we view sustainable development of the project in terms of organisation, manpower, and funding? Due to these questions, certain new methods were applied and necessary information disseminated during implementation of the South Gansu rangeland improvement project. The above were the main topics of study during implementation of the project 'Ecological management, demonstration, and popularisation of skills for highly efficient animal husbandry in Southern Gansu grassland' which is supported by Oxfam Hong Kong.

Project objectives

The project addressed the following three main problems.

- Poverty of herders
- Severe degradation of rangeland
- Low efficiency of rangeland animal husbandry on the Qinghai-Tibet Plateau

The project objectives were to increase productivity of rangeland animal husbandry and to stop rangeland degradation by both constructing artificial pastures and

improving natural pastures. The project attempted to enhance the sustainable economic development of poor local herder families and improve the environment while protecting available resources. Each of the 100 project families was given five mu of land (15 mu = one hectare) on which to grow highly productive fodder grass. This project also improved 150 mu per family of rangeland through small mammal eradication, grass plantation, fertiliser application, non-fodder grass removal, and pasture enclosures. The participatory concept was introduced to this project through step-wise review, conducted jointly by project technicians and herders, and through trainings on participatory approaches at different stages of project implementation.

The project partners

The following were cooperative partners in this project, carried out between April 1999 and September 2002.

- Hong Kong Oxfam – funding
- Lanzhou University – technical assistance
- Yunnan Academy of Social Sciences Department of Sociology – participatory assistance
- Government of Maqu County, Gansu Province – coordination
- Maqu County Animal Husbandry Bureau Grassland Station – implementation

Project implementation strategy

Adaptation to the local situation

Several characteristics of the local situation combined to make this project unique, and we explored these before beginning project implementation. Below is a discussion of these characteristics.

After pasture had been contracted to individual families, herders recognised the scarcity of pasture and soon developed a common wish to improve pasture availability by raising productivity of the existing pasture. Contracting of rangeland to individual families had created a favourable situation for pasture management and improvement by herders. In the past, pastures belonged to the community, but animals belonged to individual families; thus, herders strove to use pastures as much as possible and did not think of managing or protecting those pastures. Because there was no motivation to protect and develop the pasture, competitive grazing and overgrazing were very common.

Local herders spoken to during this study clearly recognised that the main rangeland problems they face are limited pasture area, low grass production, poisonous grass species, and rats. Zaxi of Gongma village group 3 said, "In 1958, the population was less than now, the number of animals was also less, and the grass reached horseback". His statement indicates serious degradation of rangeland and puts forward a herder's personal experience regarding rangeland issues. Pasture improvement is a common wish of herders.

The basic objective of the project to improve rangeland was identical to the government policy of animal husbandry development. Therefore, during implementation of the project, it was possible to use local governmental manpower and materials. This situation also encouraged the government to spread and

popularise the project, magnifying its demonstrative value. During recent years, the government has contracted rangeland to individual families, promoted construction of artificial pasture, and organised programmes to eradicate rats and insects from the rangeland. These have become the main activities of the grassland station under the local Animal Husbandry Bureau.

Useful traditional grazing management practices

During the project feasibility study, it was discovered that traditional grazing practices include some useful notions regarding pasture protection. These indicate that there are ideas and methods for conserving grassland embedded in herders' traditional animal husbandry practices. These ideas and methods can be directly associated with the principal guiding ideology of the rangeland improvement project.

Winter-spring pasture is differentiated from summer-autumn pasture, and rotational grazing is practiced in two of the four seasonal pastures. Winter-spring pasture is closed during summer and autumn to let the grass grow by protecting it from grazing so that there will be more grass during winter and spring.

Grassland tilling is prohibited. All herders know that tilled land would never grow grass for grazing in the future.

Herders have begun growing oats near their winter livestock sheds, which they harvest, dry, and store for winter. Oats are used as a feed supplement, especially for young calves and during snow disasters. This practice has brought livestock mortality to a minimum.

After contracting of rangeland to families, some groups of families did not fence their individual areas and instead practiced group grazing. These families made regulations based on their rich experience in animal agriculture restricting the number of animals per unit area of rangeland. In this way, they were able to maintain a balance among families and to guarantee a supply of grass throughout the year. We visited a family group in Gongma village group 3. The nine families of this group already had summer-autumn pasture contracted to them, but the winter-spring pasture had not yet been contracted. Three grazing sub-groups had been formed within the nine families. The group had limited animal numbers to 10 cattle, 20 goats or sheep, and $\frac{1}{2}$ horse per person. People having more animals than the limit had to sell excess animals, hire other grassland on which to graze those animals, or ask families with fewer animals to graze them. Families having fewer animals could rent out their grassland or graze others' excess animals. Other family groups in other villages have similar regulations. Upper limits on the number of animals per unit area of rangeland have been derived from the rich experience of the herders and from their principle of surplus – when grass in the summer pasture becomes green, there should still be grass left in the winter pasture.

In summary, the chief objectives of the government and the herders to develop the grassland and to spread technical skills were identical. A participatory approach to project implementation was therefore possible. The question was how to apply participatory concepts and methods to the goal of spreading grassland skills.

Participation by relevant groups

In this project, it was crucial to have the participation of all members of project communities, as well as of certain other relevant and influential people. People whose participation was important included herders, weaker members of the community, and concerned institutions.

Herders' groups and coordinators

Advantage should be taken of pre-existing local community groups and decision-making mechanisms for design, monitoring, and evaluation of project implementation and for spread of technical skills. In Tibetan communities, self-organised groups are well established; eight to ten families usually comprise a small unit called a 'group'. The families in most of these spontaneously formed groups are related by blood. Such organisations are closely related to the daily lives of herders. They also work as forums for discussion of important issues and for decision-making; important group issues included when to move to winter pasture from summer pasture every year, where to place the limits on livestock numbers, and how to cooperate in production activities such as cutting wool and weaving tents. Some groups also sell their animals together when prices are high, after which they rent out their rangeland or look after others' livestock for a price. These groups can be invaluable in motivating herders to participate in implementation of rangeland improvement projects in grazing areas. There were 12 herders' groups in this project. For prompt dissemination of knowledge, spreading of information, and motivation of herders, and to reduce the workload of technicians, each herders' group elected one reputable coordinator with the capability of motivating and organising group members. For motivation of women, women's coordinators were also elected. Problems faced by herders were conveyed to technicians through these coordinators. During technical skills popularisation and project activities, coordinators informed and gathered herders, accelerated the flow of information, and interested herders in self-development. During small mammal eradication from the large pasture area, herders' groups participated and worked together to manage the pasture. During grass planting, herders' groups discussed the technical skills and exchanged expertise. Mutual cooperation among families within herders' groups especially helped families consisting of women and children.

Discussion between technicians and herders were very helpful in revising and improving project design and implementation and had important significance for the success of the project. For example, if technicians discovered drawbacks in the natural pasture management of a certain family, they did not stop investment and services to that family just because its management did not meet the standards required by the project. Instead, they discussed the causes of poor management with the group of herders and determined which problems the family could overcome, which problems were faced by all families in the group, and in which issues technical or implementation aspects of the project should be changed.

Women and weak community members

Division of labour between males and females is not equal, and women tend to hold the interests of their children and their households above their own interests. Male herders in high-frigid grazing lands are mainly responsible for herding animals; selling livestock, dairy products, leather, and wool; and purchasing garments and other goods. Female herders are responsible for milking, preparing clarified butter,

weaving, carrying water, conducting household chores, and caring for children. Since women provided much of the labour for the project, it was very important that the project reflect their feelings and opinions. Thus, the project took into consideration participation by women and other weak members of the community. Women are busiest during the summer, when their labour intensity is very high and their labour duration very long. Due to this and other differences in the daily activities of males and females, timing of training sessions and services were arranged with potential female participants' convenience in mind. Much attention was paid to providing women and other weaker members of the community with technical skills and encouraging them to communicate their ideas, opinions, and problems. Technical and labour assistance was provided to families consisting of women and children, and these families were encouraged to participate in community and project activities and to monitor project results. Through this project, women's capacities were enhanced and their position in society improved.

Concerned institutions

To different degrees, the County Government, the County Animal Husbandry Bureau, the County Grassland Station, the County Hygiene Bureau, the County Education Bureau, the County Health Care Station, the County Women's Association, the County Veterinary Station, and the two Prefecture Governments all participated in the project. Participation of this variety of entities promoted project implementation. Herders' difficulties and demands were discovered and addressed by many of these authorities.

Participatory methods for selection of beneficiaries

Participatory methods were most evident in two stages of the project, selection of families and finalising by the families of the project implementation plan. The 40 families of the first beneficiary group were selected through discussion with local herders, using the participatory method of grading from rich to poor. At every project site, name lists of poor, middle class, and rich herders were made public using participatory methods, and poor herder families were declared project beneficiaries. The project provided them with the resources required for rangeland improvement free of charge. It also provided them with technical skills for rangeland improvement and other necessary services.

Technical methods

Fencing and pasture enclosures

The 150 mu site for fencing and pasture enclosures was chosen according to criteria determined by the technicians after consultation with the herders. Management of this site conformed to the traditional grazing pattern. A grazing restriction contract was made with the herders and was in effect during the growing season. After this restriction period, herders were allowed to use the pasture according to their experience and the health condition of their animals. Underweight animals were usually allowed to graze there from December to May, during which period grass was relatively scarce.

Grass plantation

After a discussion among technicians and herders, cultivated annual grasses (oats and barley) were planted for each family in nearby shed areas or greatly degraded areas. The sites and area for these plantations were determined by the herders

themselves, and mechanical tillage was conducted by the project. During the first year, technicians measured the grass plantation area of each family and drew a project construction area map. They also demonstrated to the herders grass plantation, management, harvesting, and storage. Herders took responsibility for the prevention of grazing in these areas. During the following years, technicians both provided timely technical assistance to the herders, and also collected experiences and suggestions from the herders. In the second year of project implementation, herders of Ouqiang village suggested sowing grass seed before mechanical tillage to prevent bending of the grass and to minimise physical labour. We had a serious discussion about this suggestion and found that it had some theoretical merit. Therefore, we decided to spread this skill to 100 herder families, to whom it proved very beneficial.

Small burrowing mammal eradication (zokor and pika)

Small mammal eradication was the most difficult technical skill to popularise. In the past, herders did not support pest eradication and sometimes destroyed or disturbed eradication efforts by breaking the traps used, or by simply not allowing us to enter pastures. However, after we conducted intensive herder education, they were eventually convinced of the severity of the troubles brought about by these burrowing mammals and began to welcome us and to support our efforts.

Methods of eradication adopted by the project were traps, use of single-dose poison, and a few local methods such as filling holes with water during the winter. Rat catching was practiced mainly in areas of high *Myospalax fontanierii* (common Chinese name zokor) activity. However, trapping was difficult, and herders were unable to do it themselves. Therefore, the project hired technical workers to trap, and herders only participated by determining areas for eradication and by managing livestock during eradication activities. The single-dose poison method was used to eradicate *Ochotona thibetana* (Tibetan plateau pika) in areas where *Myospalax fontanierii* was less active. Eradication of *O. thibetana* was conducted mainly during winter and spring, as herders had some leisure time during those seasons, and could therefore participate. Technicians worked together with herders to determine areas for this type of eradication and taught herders how to apply the poison safely. Technicians also made a contract with the herders concerning grazing restrictions in these areas during the period in which the poison was effective. Results of eradication activities were monitored jointly by technicians and herders, and any eradication remaining to be done after the project was conducted by the herders themselves.

Fertiliser application

To raise the productivity and quality of the fodder grass, small amounts of inorganic fertiliser were applied to severely degraded areas within the closed pasture area during each spring season. During this procedure, technicians explained the skills to herders, demonstrated the process, and encouraged them to do it themselves. In addition, local cow and goat dung were used as organic fertilisers, and trenches were dug in each project community for compost. Technicians explained the details of size and management of the trenches; and herders were required to dig the trenches, fill them up, cover them with thin membrane, and apply water and fertilisers. Through project implementation, herders witnessed the positive results of fertiliser application, so that most project families decided to apply surplus cow and goat dung to their pastures.

Replanting of grass

On barren lands in the project area, grass replanting was conducted during spring and autumn. Grass seed used was usually a locally available, superior fodder species with suitable reproductive traits. During replanting, technicians explained and demonstrated to herders how to sow seeds, cover them with soil, and observe germination. In addition, technicians taught herders how to identify the superior fodder species and how to collect seeds in order to replant the fodder grass in the absence of technicians.

Removal of poisonous and non-fodder grasses

Poisonous and non-fodder grasses in project families' closed pastures were removed manually. Herders shared their experiences about which grass species livestock did not eat, and technicians taught herders how to identify the poisonous and useless grass species in the early seedling stage. This topic was revisited each year during vegetation monitoring. Technicians also taught the herders how to remove the grasses and asked them to continue this practice.

Important issues for consideration in a participatory project

During the process of participatory exploration, 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.

Below, these issues are discussed individually.

Participatory training to familiarise project staff with participatory concepts

From the very beginning of the project, staff training and capacity building was considered important. Throughout project implementation, training sessions were conducted on the participatory approach, the main contents of which were participatory project management, participatory monitoring and evaluation, participatory mid-term review of the project, and gender issues and social development. The participatory approach was adopted for all training sessions, and the subject matter was associated with actual implementation of the project.

Staff thus obtained the skills to communicate better with herders and to conduct on-the-spot demonstrations and trainings of technical skills. Since staff considered interviews with herders a tool with which to solve existing problems in the project, herders' problems and demands were listened to and immediately conveyed to project leaders and managers. Project staff thought at first that herders were uneducated people who could be of no help to the project, but they later came to know that herders' traditional knowledge and experiences were quite useful to the project. Understanding the lifestyles and production systems of the herders helped them manage the herders' requirements, as well as the timetable and progress of the project. These changes in working attitudes of project staff were the foundation of participatory implementation of the project.

Where it was possible to gather herders, staff conducted intensive trainings for coordinators. Where settlements were scattered, technicians travelled to provide technical services to individual families. They also distributed technical information materials written in both Tibetan and Chinese. Technicians explained and demonstrated the important points of the technical skills and encouraged experienced local herders to discuss rangeland management and livestock husbandry. Exchanges between project and non-project families were increased to enhance the skills of both groups.

Use of herders' groups for project implementation and management

Self-management of herders' groups

During the exploration phase of the project, the amounts of artificial and natural pasture to be allotted to each project herder family were determined through discussion with the herders. According to the original plan, each family was to construct 20-30 mu of artificial pasture and improve about 200 mu of natural pasture. During the project feasibility study, however, promoters of the participatory approach suggested that herders themselves should determine the area of rangeland to be improved. One reason for which herders themselves needed to make this decision was that traditional herder experience prohibits the tilling of large areas of natural pasture. Thus, if herder families were each required to construct 20-30 mu of artificial pasture, they would not be enthusiastic about participating. At present, most herders have planted oats around their winter pasture sheds on only two or three mu of land.

To protect natural pasture, herders' groups have placed restrictions on the size of artificial rangeland. In order to reduce the differences between project implementation and local practice, it was suggested that determination of size of artificial pastures should be conducted under the regulations of the herders' groups. Regulations on livestock populations and maintenance of pasture quality would also be followed. If the project wants to expand artificial pasture, staff should first discuss options with the group and receive the group's consent. Only thus would the project be feasible.

To achieve community development, it is not necessary to improve all natural pasture or to construct all artificial pasture simultaneously. The project will be more sustainable if herder families and groups are given room to develop their ideas. This suggestion was adopted by the project managing committee, Lanzhou University, and Maqu grassland station. Thus, the area of rangeland to be improved was determined according to the requirements of individual families. Considering their own capacities to maintain the pasture, most herder families expressed their wishes to construct only three to five mu of artificial pasture. The area of natural pasture to be improved was also adjusted according to experiences of the herders, and 100-150 mu per family was agreed upon. Due to a disparity in level of management among herders, some families constructed their pastures together with other families; these groups varied in size. Families that ran their enterprises individually, and poor families, to whom benefits could not be guaranteed, fenced their pastures and practiced restrictive grazing.

Examples of the functioning of herders' groups

In some places, although rangeland has been contracted to individual families, high costs of fencing and placement of water sources have caused these groups to continue grazing their animals in common. In Gongma Group No. 2, small group 3, nine families still graze their animals commonly. However, their allotted grazing area is insufficient at only 207 mu per head. Therefore, this group had a discussion and decided to use their money designated for fencing to rent other rangeland. Another small group in Gongma Group No. 2 includes eight families who have divided the pasture into four parts. One part is assigned to one sub-group made of two families with similar family sizes, livestock numbers, and pasture areas. This sub-group of two families grazes their animals together.

In other instances, winter pasture has been contracted to individual families, but summer pasture has not. In Gongma Group No. 3, winter pasture is contracted to small groups. Here, every small group has already selected one to three leaders (members with good reputations) to be the nucleus of their small group. These leaders arrange meetings within their small groups and represent their small groups in meetings of bigger groups. In some small groups, sub-groups consisting of two or three families are formed to make certain decisions. One of these decisions regards the division of pasture. Pasture is first divided among sub-groups in a small group, wherein allotment of each specific segment of pasture to an individual sub-group is accomplished by drawing lots.

The above examples illustrate the wisdom of making use of pre-existing social organisations in Tibetan communities. They also illustrate these organisations' function in cooperation and decision-making, as well as in encouraging herders to participate in project design, implementation, management, popularisation, and evaluation. This will increase their level of participation and ownership, which will in turn empower herders to discuss problems, put forward possible solutions, and seek support from probable donors. All of these steps have long-term effects on sustainable project development.

Use of herders' groups and possible constraints

In order to utilise local organisations for the project, beneficiary families were divided into several small groups from different geographical areas, and each group elected one coordinator to be responsible for project-related activities. As the functions of pre-existing traditional organisations differed, small groups and their coordinators could not act uniformly in implementing the project. There were differences in the roles played by small groups and coordinators in herders' daily lives. In some places, small groups organised herders very effectively to participate in project implementation. For example, during the visit and interview at Waleka village, it was learned that small groups accomplished most of the daily production activities of the herders there and had their own set of methods and a common fund chiefly used in religious and other common small group activities. These small groups also determined times for animal migration to new pastures and limited numbers of animals.

There are also instances in which use of local organisations is difficult. For example, the 29 families selected for the project from Anmao village were scattered over a large area. They had been divided into three small groups with six coordinators. The main

accomplishments of the coordinators and small groups were oat plantation, fence repair, and fertiliser application. There were three annual meetings of coordinators for discussion of matters of common interest. In spring, they discussed fence repairs, timing of excluding animals from closed pastures, timing of migration, arrangement of grass plantation, and winter lodging. When returning after winter, they discussed fence repair and utilisation of closed pastures. In some project areas, families in the herders' groups are quite scattered; in this case, a single family does all the work, and there are no collective activities. In these areas, herders' groups are limited structures that only notify people of the processes of project implementation. Promotion of participatory skills in these areas is still a great challenge.

However, traditional organisations also have a fatal shortcoming – unequal gender considerations. According to local practice, only male members of families participate in group discussions of important matters. If male members are not at home, or there are no male members in a family, female members usually do not participate in meetings. Therefore, families consisting only of women and children are totally excluded from the social decision-making process, and their interests are not considered. At present, most poor families consist of only women and children, and thus have no place in the social decision-making mechanism.

Women's participation and gender sensitivity

Although objectives and strategies concerning gender were fixed at the beginning of the project, realising them during its implementation was a challenge. 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. Furthermore, the first project line staff (of which there were women in every group) had uninterrupted discussions with women and later conveyed their opinions at small group discussions. Males and females should attend separate technical training sessions whenever and wherever possible, and timing of female training sessions should be arranged to their convenience. Our observations showed that women are relatively less busy between November and March, and this is a good time to meet with them. However, some rangeland improvement activities are restricted by seasonal changes. For example, grass plantation should be finished by May, and rat eradication and second sowing of fodder grass seeds are also restricted to certain times. Most project work is conducted during the season when women are busiest. Therefore, from the point of view of project work and women's convenience, training sessions should be arranged during winter.

A comprehensive analytical study of gender-related division of labour was conducted during project implementation. Division of labour relating to major project activities was identified, and timely interference was carried out on crucial issues. Application of fertiliser, for which goat dung is composted and applied to natural pasture, is a main technical aspect of the rangeland improvement project. In this region, cow dung is used for burning and is basically a woman's duty. If a man dealt with cow dung, people would laugh at him. During the initial stage of the project, no men collected fertiliser to apply to rangeland. It was thus an extra job for the women. The pastures are quite large; each family had about 150 mu of pasture for improvement by fencing, so had no consideration been made at the beginning regarding gender-related division of labour, fertiliser application would have greatly increased the workload of the women.

If the only consideration were project results, there would be no need to consider labour intensity. However, overload of labour sometimes affects project results. Also, overloading of women by the project obviously does not benefit the women. Because project staff were sensitive to the gender issue, they started encouraging men to collect and apply fertiliser. At the same time, certain changes were made in the method of fertiliser application; women's workload was decreased somewhat through natural fertiliser application by goats, sheep, and cows directly to the closed rangeland during grazing. This process shows that unless the gender issue, gender-related division of labour, and effects of the male dominated decision-making systems of local communities are taken into consideration during and after project implementation, women's workload can be greatly increased and their opinions excluded from project design and policy.

This project attempted to promote women's development, and after three years of project implementation, there was a rise in women's enthusiasm to participate. They were more confident about expressing their views, had good relations with the first line project staff, and were able to put forward their ideas concerning the project. These women cared about the project and worked to maintain and repair the fencing. However, there were still some restrictions that prevented the establishment and development of women's groups; these included traditional concepts of gender, scattered settlements and poor transportation, lack of women's collaboration in technical activities, and lack of an existing mechanism suitable for a women's group.

Adaptation of new skills and assimilation of herder experiences

Spreading new grassland technical skills is not easy, because application of the new skills will change lifestyles and modes of production. Herders were totally dependent on natural pasture until new technical skills made them capable of producing grass on artificial pasture for use during winter and spring. This put an emphasis on improvement of natural pastures through grass plantation, field management, fertiliser application, and small mammal eradication. Production of grass on artificial pastures and human management of natural pastures necessitated a change in herders' traditional lifestyles and modes of production. More research on traditional animal husbandry knowledge and its similarities and differences with the new technical skills is required during project implementation. Herders having problems with such changes in their lifestyles and modes of production should be helped to overcome these problems. We may need to modify the original plans and designs of projects to make them more suitable to the production environment and the life habits of herders. During the three-year project implementation, herders expressed their great interest in new technical skills. In the initial stage of the project, we were mostly worried about small mammal eradication, because the notion of non-violence was considered the greatest obstacle of the project. However, during implementation, we found that herders already understood the importance of eradication due to grassland degradation and severe rat activities. They supported the technicians in eradicating these burrowing animals, and during the process, they learned to eradicate them themselves.

Herders' wisdom and experiences were also assimilated to improve technical measures. For example, herders suggested that the timing of oat planting should be changed to avoid wind damage to the oats. They said that grazing goats and sheep on the closed pastures at an appropriate time for an optimum duration would be

beneficial to the natural growth of the pasture – it would raise the utility of the pasture while reducing the work of fertiliser application. They put forward that they could eradicate rats by closing holes with mud. They wanted to use fencing for two different purposes, improvement of pastures and grazing spaces for feeble or sick animals; the latter greatly reduced the livestock mortality rate. This demonstrates that paying attention to herders' experiences is extremely important, and any new technical skill can be adapted to the local situation only with herder participation. We feel that if collaboration between technicians and herders were improved, there would still be much room for improvement in project design.

Lessons learned from project implementation

Below, the logistics of applying participatory methods to the grassland improvement project are discussed. These include encouraging participation by herders and women, problems encountered in implementing the participatory approach, allocating herder funding, managing project hierarchy, and promoting technical skills.

Problems and possible solutions regarding participation by herders and women

Convincing herders and women to participate in project monitoring is an important step towards empowering them to participate in project management. During project implementation, a participatory monitoring and evaluation system was established through discussions with relevant groups using training sessions and other participatory methods. During training sessions, project staff learned about participatory monitoring and herders learned that the previous monitoring system depended mostly upon technicians' sample tests and annual systemic data collection conducted in winter. Once herders started discovering problems with project implementation, they reported these to the first project line staff. Problems identified by herders concerned quality control monitoring of fencing, selection of sites for rangeland improvement, and construction of artificial pasture. Since herders and women were encouraged to regularly monitor project works, they felt much more positive about participation, and the project benefited.

Now, after only three years of project implementation, herders and women are monitoring the project. They have witnessed the significant results of rangeland improvement and artificial pasture construction and have started to volunteer labour for the project. Some herders' organisations composed of relatives were not efficient enough, but other communities had very efficient organisations for discussions and decision-making. These organisations provided good bases for monitoring by herders and women had their own direct and simple standards of evaluating project results.

Problems

Much must still be done to establish participatory management at the policy-making level of the project. Even after establishment of the participatory monitoring and evaluation system, project management was unable to determine a suitable method of establishing routine participatory management. Herders' groups and coordinators held discussions only with project staff; they did not play important roles at the management level. This phenomenon basically continued the traditional 'down to up' management and indicated that in order to establish a participatory management mechanism, an overall change in project management is necessary. The project did not clarify herders' groups' rights and created a large gap between project policy

makers and project implementation staff. Within the project management system, there were several problems with communication between policy makers and project implementation staff. The situation might have improved had policy makers been more sensitive, but they considered 'assigning tasks' to staff the most efficient and simplest way to achieve goals, and thus carried on insufficient open discussions.

Another problem was that traditional, gender-based division of labour, keeping women very busy, prevented them from participating in project monitoring and management. Also, some herders had not yet mastered the technical skills of rangeland improvement, and some families consisting of women and children only or having handicapped members were unable to perform the required fieldwork. These problems affected rangeland improvement outcomes. Further, herders and women were busiest from June through September, a period that overlaps with project construction work to some extent. Arranging project activities during the summer-autumn season requires herders to return to their pasture improvement areas on winter-spring pasture to participate in activities and monitoring. Some herders' summer-autumn and winter-spring pastures are 45 km apart, some project families are quite scattered geographically, and the transportation system is poor. Therefore, this presents a big logistical problem for those herders.

Encouraging herders and women to participate in project monitoring also increases the workload of the already-too-busy first line staff. One reason the staff are so busy is that they must conduct demonstrations of technical skills from June through September, and these technical demonstrations are another area of difficulty. There is controversy over technical criteria versus herders' methods and ideas, and it is difficult to develop a suitable combination of the two. This question will only be answered if academic institutions acknowledge that herders' knowledge is as important as that of experts.

Solutions

Due to the situations described above, we must explore and examine future working plans that will allow herders and women to participate in and monitor project implementation. These plans must first select a small group of herder families concentrated in a small area, with relatively good social organisation and four seasonal pastures for improvement and experimentation. Only after gaining experience from this can the project be implemented in a wider area; otherwise, expenses will be high and results minimal. Also, appropriate times should be arranged monthly for staff discussions to share experience and weaknesses. Issues put forward by herders during monitoring should be discussed in a timely manner and prioritised so that important issues can be addressed immediately and others can be considered. In both of these cases, timely responses and explanations should be given to herders. At present, herders' and women's monitoring of project implementation entails only collection of data. How to encourage further participation in project management and policy-making is still a big question. Strengthening of herders' and women's organisations and description of the decision-making and management function of each level of management are important steps towards an answer to this question.

Allotment and management of herder funds

For a high-investment rangeland improvement project like this one (10,000 Yuan RMB per family), ensuring sustainable investment is a question for serious consideration. In this project, two investment sources besides Oxfam Hong Kong were considered. Government officials can be influenced by successful implementation and long-term effects of a project, and the government can then be asked to invest. Investments can also be obtained from wealthy local herders to sustain such projects.

If, in order to expand the scope of the project, herders are asked to accumulate a part of project funds, participation of herders in the project, and thus project sustainability, will be enhanced. Based on results and level of herder acceptance of this project (non-beneficiary families envied beneficiary families, and beneficiary families were very satisfied with project results and with the services of the first line staff), we conclude that it is possible to raise a part of project funds in this manner. However, there are several important aspects to consider when doing so.

Aspects to consider when using herder funding

If using herder funding for a project, very poor families, and families consisting of women and children only, need a guarantee that they will not be excluded from the project because they cannot invest. One way to do this is to fix a ratio of non-investing poor families to investing families. For example, poor families, or families having less than a certain number of animals, could make up 20% of the beneficiaries. Poor families can be categorised in a variety of ways, and this ratio should vary according to site characteristics. Through participatory discussions, herders can select very poor families that will receive benefits from the project but that need not invest in it. Effort is, however, required to guarantee fairness and that selected families are truly poor and unable to invest.

The amount of money herder families can invest, and in which aspect of the project they should invest, must be decided. According to our experience, fencing is extremely expensive, and herders cannot invest the entire amount required for fencing. They should probably be encouraged to invest in materials to be used by the project, such as chemical fertilisers and seeds for artificial pasture. These herders lack cash during the seasons when grass seed is sown, so a practical and feasible method is to lend them project money as needed and let them return it in the autumn when they make cash from selling animals.

It must also be decided for what herders' returns from investments will be used; should they be used to expand the project, or should they become a common fund for use by the small group according to the common interests of its members? They can also become a social welfare fund to be lent to poor families or to increase production. No matter where it is invested, herder discussion about use of such a fund is good for community solidarity and is an effective way to enhance common participation of herders' groups in project management.

Even if the proportion of herders' investment is only 10%, it will increase workload remarkably. According to others' experience, workloads of project staff are only decreased when they successfully promote herder participation in project implementation and management.

Project staff also worry that herders may not be reliable, promising to invest a certain amount of money but never handing over the cash; or that the already-very-busy first line staff will have higher workloads due to herder investment. There is, therefore, a lack of understanding among project staff about herder investment in the project. However, from past experience, we conclude that herders themselves lend and borrow money in their daily lives and can usually be counted upon to be reliable. Regarding staff time requirements, if staff can free themselves from the task of technical skill demonstrations, they will have more time to promote herder participation and investment in the project.

There have been some positive changes in the herder investment situation. Through implementation of the first project cycle, herders got personal experience of project results. The most expensive task in the project, fencing, had already been completed by that time. Only annual expenses, such as purchase of seeds, were left. Some herders then used their own money to buy seeds. In previous years also, herders had bought oat seeds themselves but did not buy many, since they were needed for only two or three mu of rangeland.

The key points in promotion of herder investment are to convince herders of the importance of investment and to explain to them in detail the process of investing. In some villages, herders' groups discussed the ratio of herders' investment early in the beginning stage of the project. However, further discussion was still required to create a policy for improving the system. It is suggested that a detailed plan for herder investment be prepared, including ratio and mode of investment and uses and details of management, before project implementation next year.

According to others' experiences in herder investment, money can be lent to herders in spring or summer to buy grass seed, and they can pay back the loans in autumn when cash is available to them. In this way, the same money can be used during the following year. However, plans should be made to expand the influence of the project and increase the amount of investment. The area of improved rangeland should increase every year, and the number of beneficiary families should increase accordingly. There should be a detailed task design, which should be improved throughout implementation by discussions with herders.

Managing project hierarchy

Slowness in conveying and responding to problems was the biggest constraint to participatory project development. Establishment of a management system is an important step towards sustainable development and local assimilation of the project. The first cycle of the rangeland improvement project was coordinated by Lanzhou University. A leaders' group had been formed consisting of coordinators, county government officials, and leaders from the Bureau of Animal Husbandry. This group took responsibility for project implementation. Under the implementation group, there was a project office to carry on day-to-day matters. Grassland station staff were responsible for daily operations and for spreading technical skills among herders. This management hierarchy had too many levels; in this system, when a project implementation problem was faced, it had to be conveyed to the project office through the first line staff. The project office reported it to the responsible person in the implementation group.

Participatory approaches should first be applied to internal management of the project itself. Although many people were involved in the project, most of them did not participate in daily management of operations and implementation. Only three persons – Project In-charge from Lanzhou University, Chief of the Bureau of Animal Husbandry, and Chief of the Grassland Station – were responsible for project coordination and management, and decision-making authority rested with them. The first line technical staff, on whom implementation of the project totally depended, were not part of the project office. Thus, there was a gap between decision-making and implementation. Office staff could not accompany first line staff to solve everyday issues, and first line staff did not have the authority to create or adjust major project policies.

Project achievements

During the three-year implementation, anticipated results were achieved in all project parameters. The effectiveness of integrated application of the various technical skills was greater than is implied by simple addition of the effectiveness of the individual technical measures. Hence, the results of the project were very practical. During project implementation, annual grasses were planted in three consecutive years. Implementation of rangeland improvement measures and participation of herders, especially women, enabled this project to exceed other rangeland improvement projects in terms of economic, social, and ecological aspects.

Economic achievements

Although there was continued summer drought in Maqu County, and part of the project area underwent winter snow disaster, the mortality rate of adult livestock of the project area was two percent lower than that of the county as a whole, meaning that some 900 cattle, sheep, and goats were saved. The survival rate of young calves was raised by 30%, meaning that about 3,000 more young calves survived than otherwise would have. Artificial pasture and enclosures played key roles in protecting livestock from disaster. Grass production of artificial annual grass species was 3,544 kg/mu. Production of native grass increased to 453 kg/mu from the previous rate of 271 kg/mu. There was a notable change in the standard of living of project families. For example, in one family in the project area of Da'erqing, the head of the family, Lama, is a ten-year-old boy. He has a mother who is over 60 years old and an unmarried elder sister. They had 40 cattle and 40 goats before project implementation, and now they have 100 cattle and 100 goats. Last year, they bought solar energy lights. Another example is that of Sangpa's family in the project area of Anmao. This family increased their goat numbers from 46 to 150 using their fenced pasture. Cairang Dongzhibu's family in Anmao did not have livestock but earned 3,500 Yuan per year by renting his fenced pasture to others.

Social achievements

This project addressed the gender issue, and women's participation was considered an important aspect of policy making and development. The project thus had a tremendous effect on gender development in the high-frigid grazing land. Beneficiary women's labour intensity was slightly reduced, while their status in the family and society and their right to make decisions were raised to some extent. In the past, women herders did not appear before guests. Now, they have started to visit with guests and actively exchange ideas and opinions.

Through application of science and technology and dissemination of technical skills, livestock husbandry was enhanced. As a result, production capacity and the standard of living were increased remarkably.

There were notable changes in grazing habits. For example, herders of Luoyonghong and Waleka villages of Gongma Group 3 extended the grazing duration of winter pasture by 20-30 days, which greatly reduced pressure on degraded summer pastures and promoted their restoration. As it is not necessary for herders to follow their animals throughout the day in the winter pasture, labour was also saved.

There have been great changes in herders' ideology, illustrated by the fact that beneficiary families started sending their children to school and that financially weak herders are now benefiting from cooperation. Non-project families began studying the rangeland improvement technical skills learned by project families, and this led to changes in their ideologies, as well. For example, Luobai from Ouqiang, although he was not included in the project, conducted fencing and grass replanting under a project family's direction and supervision; in this way, there has been notable improvement in some non-project families' economic condition.

Due to project implementation and reporting, leaders of the Party and of the government were compelled to reconsider conventional mechanisms for elimination of poverty. Changes were also made in the traditional mode of management. Furthermore, the Oxfam project is now not only popular in Maqu County, but has also had great influence in Gansu Province. Hong Kong Radio, Gansu TV, and Maqu County TV broadcast special programmes on the Oxfam poverty elimination in rangelands project, and this played a key role in attracting more external investments to Maqu County. These investments came in the context of the national policy of development of western China, as well as ecological construction.

Ecological achievements

Through implementation of integrated rangeland improvement measures, this project stopped the degradation and desertification of project area rangeland. Proportions of poisonous and non-fodder grasses were reduced by 20%, and proportions of superior fodder grasses were increased. Troubles due to small mammals were reduced remarkably, and in some places, rats were totally eradicated. Project implementation had positive effects on water and soil conservation, prevention of wind erosion, fixation of sand dunes, protection of water sources, purification of air, and improvement of vegetation composition and structure. The project has demonstrated methods for improving the overall ecological health of the grassland.

Suggestions for future projects

Sustainable development of grassland animal husbandry should not depend on technical measures only. Rather, technical skills, culture, government coordination, and gender issues and women's participation should be integrated. The following are suggestions for improvement of future projects such as this one.

Establish fair methods for selecting beneficiary families

Before project design and implementation, a detailed baseline survey should be conducted. Project beneficiary families should be selected on the basis of this survey

and through active participation of herders. Justice and transparency should be maintained in the selection of project beneficiary families.

Change technicians' working styles

Change in technicians' working styles from 'simple demonstration to herders' to enabling herders to do it themselves increases herders' faith in technicians. Herders make up the main body of technical skill popularisation; therefore, attention should be paid during project implementation to capacity building of herders and assimilation of their experiences, and issues raised by herders should be dealt with immediately.

Organise herder interactions

After project implementation, herders had acquired the basic ideas and experiences of rangeland improvement technical skills. Organisation of interactions among these herders will enhance their existing organisations and promote further rangeland improvement. There should be interactions among herder families within the project, project and non-project families, and old and new project families. Such interactions will establish the functions and roles of herders in the transmission of technical skills, as well as facilitate plan design. Experiences of others show that farmers learn more effectively when taught by other farmers. In rangeland areas, where settlements are so scattered, such types of interaction are highly valuable. During our participatory review organised by herders, some herders said that they had already introduced project technical skills and experience to non-project families, and some non-project families had started to invest in rangeland improvement. Enhancing interaction among herders will expand the effective area of the project and systematise interactions already in practice.

Advantage should also be taken of women's potential to self-organise; women should be organised and their participation in the project expanded. Gender equality in control of resources should be promoted and women's influence in the community strengthened. Women's capacity building should be addressed during project implementation. These activities will ensure a good foundation for sustainable project development.

Promote herders' groups and determine the function of a herder coordinator

Promotion of herders' groups and of an effective herder coordinator depends on whether there is anything to be accomplished by the groups and the coordinator. If returns from herder investments are used in a community fund, or interactions among herder families must be organised, herders' organisations can be encouraged to take over such activities. Establishment and operation of herders' groups should be explored and functions and capacities of coordinators strengthened.

Develop a feedback system for herders' needs through the first line staff

During the participatory review, herders reported on many of their needs, not all of which were related to the project. Some needs were within the scope of the first line staff, while others were completely unrelated. The review revealed that herders considered first line staff not only technicians, but also sources of information and important media for contact with the outside world. It would be an injustice to herders not to allow them to reflect needs unrelated to the project or to the staff's work. Therefore, a broader system of information collection and feedback should be

established by project management. Separate methods for collecting, sorting, processing, and reporting opinions and suggestions either related or unrelated to the project should be established. New projects or issues requiring further survey may arise from these needs of herders. For example, the idea for an explorative project regarding health problems of rangeland women arose in this manner. An effective information feedback mechanism could be the following.

Herder → Coordinator → Technician → Project office → Oxfam

Establish an efficient system for popularisation of rangeland improvement technical skills

Project sustainability depends upon whether herders, local governments, and technical departments are able to independently accomplish maintenance and development tasks. Sustainability of technical skills depends on three things: herders' initial mastery of the skills, establishment of technical assistance services linked to the local technical department, and funding to support these services. Encouraging governments and herders to invest in rangeland improvement (as 'payback' for development of the skills involved) can guarantee sustainable funding. Therefore, small loans for rangeland improvement should be considered. Also, the technical skill popularisation system should be 'bottom-up', and the technical service group should provide continuous follow-up guidance, guaranteeing continuity of technical skill innovation.

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



Cover Photo: Preparing workplans for predator proofing of livestock corrals (*from the presentation by Rinchen Wanchuk*)

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

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Introduction

Livestock depredation by snow leopards and wolves is widespread across the Himalayan region (Jackson et al 1996; Jackson and Wangchuk 2001; Mishra 1997; Oli et al. 1994). For example, in India's Kibber Wildlife Sanctuary, Mishra (1997) reported losses amounting to 18% of the livestock holdings, valued at about US \$138 per household. The villagers claimed predation rates increased after establishment of the sanctuary, but surveys indicated a dramatic increase in livestock numbers accompanying changes in animal husbandry systems (Mishra 2000).

Similar conditions are found in the Hemis National Park in Ladakh, India, which covers 3,350 square kilometres of the trans-Himalayan Range of Ladakh (Fox and Nurbu 1990). The park offers 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 scattered across three valleys. They grow barley and a few vegetables, and own more than 4,000 head of livestock, of which 81% are sheep and goats and 11% are yaks, cattle, and crossbreeds. Tourism provides an important source of supplementary income. Ladakh was opened to tourism in 1974, and the Markha Valley circuit through Hemis National Park remains the most popular trekking route, with about 5,000 visitors per year.

The key management issues involve increasing levels of complaint over livestock depredation by snow leopards and wolves. A survey of 79 households in 1999 indicated that park residents owned 3,977 head of livestock, comprised of six different kinds, with an average household holding of 50.3 animals, consisting mostly of sheep and goats (Bhatnagar et al. 1999). Only 29% of households owned any yaks or crossbreeds, while 29% and 25% did not own a donkey or a horse, the primary pack animals in the area.

Local villagers reported losing 492 animals to predators over a 14-month period from late 1997 to early 1999, equalling about 12% of the total livestock herd and valued at an estimated \$23,500 (US). The mean annual household loss was estimated at 6.2 animals, an average value of \$297 per family. This is clearly a significant economic impact to these pastoralists.

Snow leopards and wolves were associated with 55% and 31% of presumed depredation incidents, respectively, with sheep and goats constituting 75% of all stock lost, followed by yak/cattle (13%) and horses (8%) (Bhatnagar et al. 1999). Three settlements incurred 54% of all known or presumed depredation (Markha,

37.4%; Rumbak, 9.1%; Chokdo, 7.5%), according to the interview survey. Depredation rates varied geographically with distinctly recognisable 'hotspots', as illustrated in Figure 1.

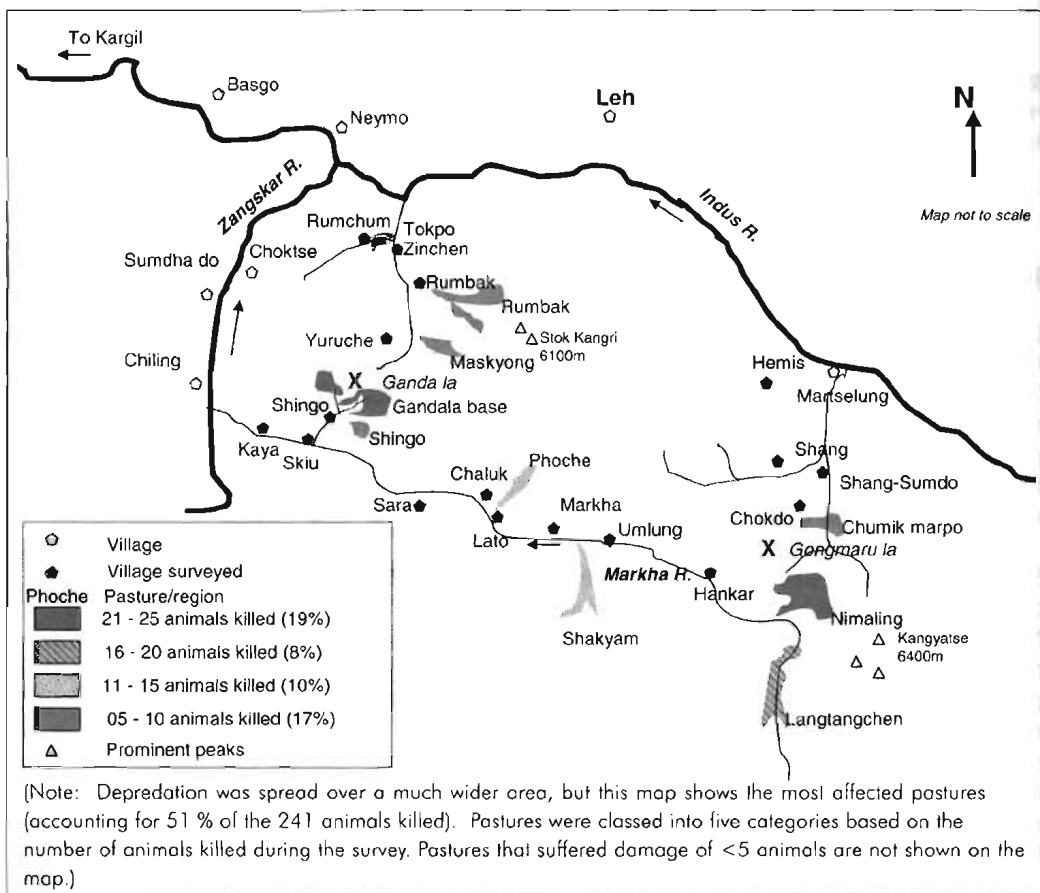


Figure 1: Depredation hotspots in Hemis National Park, India

Snow leopards have no trouble jumping over the low stone walls which enclose most livestock pens. Thus, the most significant and adverse impact occurs when a snow leopard enters a poorly constructed corral and then wounds or kills all of the crowded sheep and goats, which cannot escape the enclosure. While incidents of multiple or 'mass killings' totalled only 14% of all the depredation incidents tallied (N = 210), they accounted for nearly 50% of all livestock lost to predators. Understandably, such events arouse considerable anger among livestock owners, who may retaliate by poisoning and killing the suspected culprit.

With rising complaints from the local populace, the Ladakh office of the Jammu and Kashmir Wildlife Department initiated a compensation programme in 1996 meant to benefit the local population. However, due to lack of funds and cumbersome registration claim procedures, it backfired. Often, it required a herder to trek for several days to Leh, where the office is based, and after having to run from 'pillar to post' and waiting for two to three years, the compensation received was not sufficient

to make up for all that effort invested. These factors have led to deteriorating relations between the park authorities and the local people, accompanied by increased evidence of retribution towards snow leopards.

This is the point at which the Snow Leopard Conservancy (SLC), an international non-government organisation (INGO), became involved, with the aim of addressing root causes for depredation losses. SLC's primary objectives are:

- to reduce livestock losses to depredation by snow leopards,
- to enhance rangeland habitat and prey populations through community-based stewardship and sustainable resource management, and
- to increase local incomes and reduce dependency on animal husbandry.

Remedial actions and planning process used to address livestock depredation in Hemis National Park

Recognising the importance of a bottom-up rather than top-down approach, we are employing appreciative participatory planning and action (APPA) as the driving process for involving villagers in planning and design of appropriate remedial measures. APPA combines the advantage of building upon the community's strengths – improving what works to make it better – with low-cost, locally appropriate solutions. When APPA is applied with basic tools from participatory rural appraisal (PRA), planners and stakeholders benefit from local people's wealth of traditional knowledge relating to animal husbandry and predator occurrence or behaviour.

APPA is used throughout the project to facilitate interaction between the various players and stakeholders. It combines concepts from appreciative inquiry (as applied in business leadership training) and participatory learning and action (PLA, Pretty et al. 1995) in a collective inquiry and planning mechanism aimed at fostering consensus and achieving cohesive actions among a range of participants. APPA operates under two complimentary premises. 1) What you seek is what you find – if you look for problems, then you will find more problems. Conversely, if you look for successes, then you will find more successes. 2) What you believe in is really what matters most – if you have faith in your visions or ideas for the future, and if these are do-able or believable, you can achieve success without waiting for the government or an outside agent to take you there.

APPA is practiced through a sequential, reiterative process that seeks to (1) **discover** the community's strengths and its valued resources; (2) **envision** their short and long-term futures if the necessary resources were suitably mobilised and the community acted in concert; (3) **design** a basic action plan for guiding both development and nature protection in ways that substantially limit long-term dependency upon outside financial sources or technical 'know-how'; and (4) **motivate** participants to initiate community-improvement actions **immediately** and largely on their own, rather than delaying the process until 'some time in the future'.

Effective remedial actions hinge upon a sound understanding of the root causes for depredation, which requires a deep appreciation of how people manage their domestic herds and their rationale for decision-making. PRA tools enable planners and villagers alike to obtain a wide range of information on existing conditions during the 'discovery phase' (Box 1).

Box 1: Examples of PRA tools used for appraising livestock depredation and animal husbandry patterns

- Map of natural resources and village assets
- Map of depredation 'hotspots' and seasonal pastures
- Calendar of seasonal livestock movements and daily herding cycle
- Calendar of seasonal depredation losses (shows peak depredation periods)
- Pasture ranking with respect to depredation and other losses
- Pair-wise matrix ranking of major sources of livestock mortality
- Ranking of different guarding measures
- Income and livelihood ranking matrix
- Semi-structured interviews to assess predation causes and patterns, along with possible remedial actions
- Venn diagram showing village institutions affecting livestock production and management
- Village or pasture walk to obtain first-hand understanding of livestock management practices and issues

The participatory discovery phase exercises conducted in the five settlements of Markha, Rumbak, Skyu, Kaya, and Hankar all implicated poorly constructed livestock pens and lax daytime guarding practices as the primary cause of depredation. Stock are allowed to forage, often completely unguarded, in areas with well-broken terrain and cliffs, which is prime habitat for snow leopards (Jackson et al. 1996). The fact that domestic livestock now substantially outnumber natural prey only invites loss to wild predators. Historically, there has been better emphasis on daytime guarding, and problem predators were controlled through trapping and other traditional control methods (which are no longer permitted by the government). With more children going to school and youths increasingly reticent to assume the difficult livelihood of livestock herding, even highly vulnerable small-bodied livestock are left to graze unattended during the day. While baseline documentation is lacking, predator numbers appear to have increased due to park regulations and patrolling by park guards. The mapping and ranking of pastures clearly suggests that depredation rates vary with locality, presumably reflecting differences in predator densities, habitat suitability, and herding patterns.

The next step entailed envisioning how each village might look within a time frame of one to two years (short-term) and five to 10 years (long-term) if the community acted to reduce predation losses, protect snow leopards and other wildlife, and successfully enhance their income-generation skills. Images from these individual and collective 'dreams' provided a firm basis upon which to collaboratively design remedial measures for reducing depredation loss, improving household income, and promoting wildlife conservation and stewardship. Participants tended to visualise a situation in which people and wildlife lived in harmony, and in which the people's prosperity supported this balance.

Remedial measures ranked highest by villagers were predator-proofing of night-time corrals to prevent multiple losses of livestock, followed by protection of the natural prey base and herder education to improve day-time guarding and animal husbandry practices. Since predation on the open range cannot be eliminated, we also concentrated on providing skills training to enhance villagers' capacity for income

generation and for capture of more tourism revenue as one means for offsetting the economic impact of depredation. Environmental education by SLC, using culturally-appropriate posters and other materials was ranked the lowest.

Participants readily concurred that virtually all existing corrals were poorly constructed, with low and flimsy walls which offer little or no deterrent to a predator intent on an easy meal. Participatory planning enabled stakeholders to design and construct predator-proof night-time enclosures with strong, high (2.5-3m) walls and mesh wire roofs to preclude any access from above, along with well-made wooden doors. Corrals constructed in a top-down manner (such as those used to date by the Wildlife Department and several local NGOs) were 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 3m high walls!

Villagers were asked to follow 'best practices' guidelines in designing remedial actions. These actions should be 1) environmentally responsible; 2) economically sustainable within the local context; 3) socially responsible (building upon proven traditions and cultural values that protect nature rather than damaging it); and 4) implemented under a mutually agreed upon and signed 'work plan' setting forth the responsibilities, contributions, and obligations of each partner as described below (Jackson and Wangchuk 2001). Clearly, any action must comply with the park's rules and regulations, as well as be sensitive to local wildlife species and habitat management needs. The action should not result in fewer snow leopards or blue sheep and could not allow hunting, trapping, or poisoning of animals. Best practices also provide an avenue for blending external expertise and scientific knowledge with local traditional knowledge. This better ensures remedial measures will meet the park's regulations while offering room for locally flexible designs based upon crop and livestock damage control lessons learned in other areas.

It is important to agree upon what can and cannot be realistically achieved in terms of reducing loss, and to understand the impossibility of eliminating all livestock depredation from a particular area. For example, there is no easy solution to depredation on the open range. Large-bodied stock like yaks, yak-cattle crossbreeds, and horses need to roam widely when foraging, and consequently, are rarely tended by shepherds; yet, they may also fall victim to snow leopards or wolves, especially in winter when they are weaker.

Using a poster depicting good and poor animal husbandry practices, and which illustrates examples of some economic and social benefits associated with protecting wildlife, we have explored ways in which wildlife can be of benefit to the local people. In this regard, we look at how communities might improve upon what they are already doing, rather than trying to establish an unfamiliar activity or economic system. In Ladakh, where adventure trekking is well established, local people needed help in capturing more tourist dollars and other indirect benefits without increasing their dependency upon tourism in these uncertain times. To date, we have concentrated on skills training for operators of 'parachute cafés' (recycled Army-surplus parachutes used as tented, temporary facilities). Training was aimed at improving their menus, hygiene and campgrounds. The parachute cafes will also serve as focal points for providing tourists and local communities with information on wildlife viewing and conservation opportunities. Our next step, in collaboration with The Mountain Institute (TMI), will be to build upon villagers' desire to develop traditional homestays.

The Action Plan specifies details such as: **where** (location); **who** (responsible party or parties); **what** (details of required inputs and activities); **how much** (quantity); **when** (scheduling); **how implemented** (method or methods to be used); and **how monitored** ('success', or effectiveness, indicators to be used by both SLC and the community). Participants produced drawings illustrating the improved livestock enclosure and related design documentation on enclosure dimensions and required materials. A typical improved livestock pen for sheep and goats is 18 x 35 feet with an eight-foot high stone wall, and an open roof covered by 4 by 4 inch wire mesh and supported with wooden poles every few feet. The structure has no windows, and a single wooden closely fitting door that can be securely locked at night (Figure 2). Materials cost USD \$400-600, depending on transportation costs for those items purchased in Leh (wire-mesh, poles, door, door frame, hinges, and cable fasteners). Two such structures were sufficient for protecting all sheep and goats from the 21 households of Skyu-Kaya using one particular pasture called Lilangste.

The Action Plan includes the names of households and user groups who will assume responsibility for constructing and maintaining the improved pen. Any new or re-constructed corrals must benefit all livestock-owning households who agree not to file any compensation claims with the Wildlife Department and to immediately report any instances of poaching to the authorities. All remedial actions must produce conservation benefits, and a reciprocal contribution in the form of labour and collection of locally available materials is expected from the participating community. Livestock owners must assume responsibility for maintaining the structure in good repair and for monitoring the effectiveness of the intervention using established criteria and success indicators.

We ensure that the improved facilities are no larger than the existing structure or structures they are intended to replace, in order to avoid encouraging an increase in livestock numbers. Most pastures are already under substantial grazing pressure, in effect forcing blue sheep onto steeper and less productive pastures. An important long-term goal is to improve forage conditions for native prey species in order to help reduce depredation pressures on domestic stock. Clearly, this will require concerted actions, such as rest-and-rotation grazing schemes, establishing special pastures reserved for wildlife, and other measures for enhancing forage plant seedling establishment and productivity.

The agreement is developed for signature by the primary implementing agency and beneficiary community, represented by the leader of each corral user group, or in the case of a small settlement, by a member from each household. The agreement specifies key conditions; such as the materials, labour, and technical expertise each partner will provide; special provisions for protecting snow leopards and their prey species; and specific indicators the community will employ for measuring the success of the proposed initiative. Local people identified the following expected outputs or indicators for assessing project success.

- Numbers of livestock lost would decline very significantly, and no multiple depredation incidents would occur, if corrals are properly constructed, utilised, and maintained (village stewards are being trained to log livestock mortality).
- By eliminating multiple predation incidents, community attitude toward snow leopards, general tolerance of wildlife, and the presence and regulations of Hemis National Park would improve markedly (SLC is assessing these attitudes through focused interviews and a comprehensive questionnaire).



Before predator-proofing, prime snow leopard habitat in Husey Nullah



Same corral with higher walls, door and mesh roof

Figure 2: Example of a corral before and after predator-proofing

- Herders would spend less time guarding at night, leaving time for more productive activities.
- Villagers would earn more income, especially if corral improvements were accompanied by efforts to enhance livelihood skills from tourism (to be monitored annually by SLC staff). Over time, these changes would lead to more stable wildlife populations within Hemis National Park, along with a better working relationship between park authorities and local residents.

Conclusions

The highly participatory process employed under APPA indicated that the most cost-effective option for reducing depredation, especially multiple losses to snow leopards or wolves, lay in predator-proofing existing structures. Furthermore, APPA is a powerful tool for empowering herders and farmers to better assist park managers to protect the fragile alpine habitat for the benefit of wildlife, as well as people (TMI 1997). It builds pride by highlighting positive community attributes and building upon traditional values and successes. This approach is highly effective in mobilising rural communities towards greater self-reliance, and thus a more harmonious long-term relationship with the National Park in which they live, and on whose resources they depend so heavily. The degree of success appears to be proportionate to the community's perceived 'ownership' of the project and the materials or resources it contributes. The greater their involvement, commitment, and contribution, the more likely the structure will be well looked after.

We illustrate these conclusions with two examples from our work in Ladakh. Construction of the first corral in Markha was delayed due to a late winter. Eventually, the structures had to be increased in size from the original plans, because the villagers had deliberately underestimated their livestock holdings, fearing they may be taxed more by the government for reporting actual herd sizes. They used the corral before it was fully predator-proofed, and lost 29 animals to a snow leopard. As donors, we felt some responsibility for the loss and called a community meeting. The household most affected had recently suffered a death, and the village as a whole assumed full responsibility for what had happened, attributing the incident to a traditional 'Mountain Spirit'. No compensation was requested.

The residents of Skyu-Kaya scheduled the corral improvement for the summer. But, when the time came, they found they were short of manpower, because many households were out with their pack animals accompanying trekking groups. The problem was solved when each household contributed toward the substantial cost of hiring outside labourers to work under the supervision of a good stonemason (known locally as a 'mistri'). Recently, a villager told an SLC staff member that, "In the late evening, after our sheep and goats had spent the day grazing, we herded them into the new pen, locked the door, and walked the two miles to our home. When we returned in the morning, there were tracks of a snow leopard all around the pen. It had even jumped up onto the wall. This happened two nights in a row, but we lost none of our animals! As Buddhists, we are very happy, for the sake of our livestock, and for the snow leopard that might now go back to hunting blue sheep. Also we are very happy, because now we shepherds no longer have to lie awake on the cold ground next to the pen. We can go home and get a good night's sleep."

It is apparent that corral predator-proofing can go a long way to reducing losses and alleviating conflict due to livestock depredation by snow leopards. As the experience in Ladakh shows, 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. For example, a promising approach rests in promoting a set of carefully designed and monitored community-based stewardship initiatives, in which local people benefit by offering visitors good wildlife viewing opportunities, local nature guides, traditional homestays, attractive camping sites, and handicrafts for sale. Wherever possible, we believe that corral predator-proofing should be implicitly linked with specific conservation measures and initiatives aimed at enhancing local incomes. Toward the long-term goal of community-based conservation and resource management, we have started to recruit local villagers to serve as 'Wildlife Stewards'. For more details, visit the Snow Leopard Conservancy's website at www.snowleopardconservancy.org.

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



An aerial photograph showing a vast, flat landscape with a patchwork of agricultural fields. The fields are arranged in a grid-like pattern, with some areas appearing darker (possibly water or dense vegetation) and others lighter (possibly bare soil or low-lying crops). The overall terrain is relatively level, with some subtle variations in color and texture indicating different types of land use or vegetation. The fields are interspersed with narrow, light-colored paths or roads, creating a complex, geometric pattern across the landscape.

Cover Photo: Agricultural fields at 4100m within the Kunasa pasture area
(from the presentation by Yildiz Aumeeruddy-Thomas)

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

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Background

Geography and culture

Dolpo is a cultural area in Nepal inhabited by the Dolpo-pa⁴ (Jest 1975, Snellgrove 1992) in what is today the administrative district of Dolpa, bordering the Tibet Autonomous Region 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, established in 1984 to conserve a unique trans-Himalayan ecology and biodiversity. The largest national park in Nepal, Shey Phoksundo (SPNP) covers an area of 3,555 sq.km, with a buffer zone covering a further 1,329 sq.km. The park is inhabited by about 3,000 people; some 10,000 people live in the peripheral buffer zone area.

Dolpo has a strong Tibetan cultural influence, with most of its inhabitants, especially in the northern part, tracing their lineages to Tibet (Jest 1975, Snellgrove 1992, Lama et al. 2001). Upper Dolpo is culturally Tibetan, with Bonpo⁵ and Buddhist followers. Lower Dolpo, located to the south of Phoksundo Lake, has villages that are culturally Bonpo Tibetan, such as Pungmo and Rigmo, and in the southwest villages that are a mix of Bonpo and Hindu, including Kaigaon, Hurikot, Pahada, and Tripurakot.

The Kanjiroba range, which culminates at 6883m, crosses the park transversely above Lake Phoksundo, the second largest and the deepest lake in Nepal, separating the area into southern and northern portions. The southern part, Lower Dolpo, is predominantly covered with temperate, sub-alpine, and alpine vegetation and has an annual precipitation of about 1,500 mm. The northern part is in the rain shadow of the Kanjiroba and Dhaulagiri ranges, and thus is a treeless, trans-Himalayan, arid area with an annual precipitation of less than 500 mm.

Changes in Dolpo lifestyle: external factors

The political upheaval in the Tibetan Plateau, and the subsequent closure of the Tibetan border in 1959, have had major effects upon the local economy and livelihoods of all the northern border districts of Nepal, including Dolpa, where the Dolpo-pa had traditional rights to graze their cattle on the Tibetan plateau (Rai and

⁴ 'Pa' means inhabitant. There is a very strong sense in Dolpo of belonging to a different cultural area than those of Jumla, a culturally Indian district located to the west; and Mustang, a culturally Tibetan district located to the east.

⁵ Bonpo is the ancient religion of Tibet; it almost disappeared after Buddhism expanded in the country. Bonpo is now assimilated into Buddhism and has many common features. Very few pockets of Bonpo culture still exist. Dolpo is one of the rare Bonpo cultural areas remaining today.

Thapa 1993, Richard and MacLeod 1994, McKnight 1997, Bauer 1999). Subsequently, the Dolpo-pa have brought their herds to graze in pastures in Lower Dolpo (Kaigaon and Rimi) and in the neighbouring districts of Jumla and Mugu.

The establishment of Shey Phoksundo National Park in 1984 has affected the livelihoods of the communities both inside the park and in the buffer zone. The major aspects of park management that affect local livelihood systems are as follow.

- The buffer zone areas demarcated inside the park are limited to the villages and surrounding agricultural land and do not include the pastures and forests. Therefore, local communities lack formal control over these areas and are required to pay royalties to the park, particularly for the use of timber.
- People living inside the park are granted traditional use rights of access to resources such as pastures, including for medicinal plant collection exclusively for livelihood purposes.
- Collection of any resources inside the park for commercial use is strictly forbidden.

Another major event in Dolpo's history was the opening of an airstrip about 20 years ago in Juphal, two hours' walk from the District Headquarters at Dunai. There is now an established trade in medicinal plants, amounting to 40-60 tonnes of dried plants each year. There is also increased movement of people to and from Dolpo.

Lower Dolpo was opened to foreigners in 1989; Upper Dolpo was opened in 1992 to trekkers for a high fee. The influx of tourists has resulted in the opening of small, local tea-shops and lodges along the major trekking route in Lower Dolpo, and has provided local households with additional income. Another major change has been the opening of local schools – such as Crystal Mountain, Taprizi, and Shelri Himal – with the support of international non-government organisations (INGOs). These schools focus on traditional, in addition to modern, curricula.

The initiation of integrated conservation and development work by national and international organisations has also brought about certain changes. These include introduction of literacy classes and savings and credit schemes for women, stipends for girl students, promotion of solar lighting and fuel-efficient stoves, and strengthening of traditional healthcare.

Trade in a parasitic fungus, 'yarcha gunbu' (*Cordyceps sinensis*), has increased in Dolpo, as has trade in medicinal plants. Yarcha gunbu (literally summer-grass winter-insect) has brought additional income to local households. Each year, traders from places such as Kathmandu and Lhasa gather in the Dho valley to purchase yarcha gunbu. With this additional income, increasing numbers of people travel to Kathmandu for the winter.

Monks educated in monasteries in India and Kathmandu have been able to establish centres abroad and have been able to raise funds for monastery (gomba) renovation and community service in Dolpo, often with the help of INGOs. In July 2000, the Dolpo Saldang Shey Service Centre organised a major cultural and religious programme at Shey Monastery to celebrate their 12-year festival. Thousands of pilgrims, tourists, and traders gathered for the week-long event marked by traditional song and dance, religious empowerments, and circumambulation of the Shelri mountain.

Pastoralism in Dolpo

Studies conducted on pastoralism in Dolpo all confirm that the economy of Dolpo agro-pastoralists is an intricate system whereby agriculture, pastoralism, and trans-Himalayan trade constitute an integrated management system and way of life based on social dynamics, including communal regulatory systems (Jest 1975, Richard and MacLeod 1994, McVeigh 1994, Bauer 1999). Pastoralism in Dolpo dates back at least 1,000 years (Miller 1987). Indeed, Dolpo and the upper Kali Gandaki, including Lo, are known to have been colonised in the seventh and eighth centuries by people from the ancient kingdom of Zhangzhung, located in Western Tibet (Jest 1975, Kind 1999).

As a result of the very steep topography, arable agricultural lands are very restricted and are limited to relatively flat valley bottoms and gentle slopes; lands around villages are often terraced. Some agricultural fields are found as high as 4100m, especially in Kunasa and Upper Dolpo. The use of manure and compost is an important practice of the Dolpo-pa and maintains soil fertility; this is one of the many contributions of livestock to the local livelihood system (Richard and MacLeod 1994). Agriculture, however, only provides three or four months' supply of food, and reliance on pastoralism and trans-Himalayan trade is high. Pastoralism contributes to local livelihoods by providing milk, butter, yoghurt, wool, and animal protein (although animals are usually not killed for their meat in Dolpo but are only used if they die accidentally). Animals are also used for draught power. Finally, yaks and sometimes goats contribute to trans-Himalayan trade, while horses are used for travel. The trading system, an exchange of products from the Tibetan plateau (salt, wool, milk products, and some cereals from Dolpo) with grains from the lower valleys, is essential for the economy of the Dolpo agro-pastoralists. Livestock include yak, 'dzo' cross breeds of yak and cattle, cattle (mostly in the southern villages located outside the park), goats, and horses.

Patterns of pasture management in Dolpo, based on studies conducted in Rigmo (Richard and MacLeod 1994), Saldang (McVeigh 1994), and Pungmo (McKnight 1997, Parajuli 1998), and the work conducted by Bauer in Upper Dolpo (1999), clearly indicate that Dolpo pastoralists have a flexible approach to rangeland management, which maximises the benefits and mitigates the effects of concentrated grazing. Rotational grazing, monitoring of plant and animal performance (presence or absence of toxic plants, height and size of fodder grasses, dung size, milk production and quality), and deferred grazing are current practices. In the Himalayas, it is said that the size of yak herds per household is limited by labour constraints to 25-30 (Miller 1987). McVeigh (1994), on the basis of five households interviewed, notes that some families may have up to 45 yak, with a maximum of 90 animals, including yak, sheep, goats, dzo, cattle, and horses. The Dolpo-pas' strategy to maximise benefits is to graze different types of animals with different biologies and aptitudes for altitude, and preferences for different grasses, in different ecological niches. This ensures maximum benefit with minimum impact on the environment (Bauer 1999).

Richard and MacLeod (1994) argue, in the case of Rigmo, that lack of winter feed is a limiting factor for livestock numbers and that current stocking rate does not exceed the carrying capacity of Rigmo ranges. According to Bauer (1999), Dolpo herders value the productivity, nutritional value, and palatability of plants rather than species diversity as such, and make decisions on where to graze their animals based on ethno-ecological knowledge of the values of different areas for livestock productivity (Bauer 1999).

McKnight (1997) describes the logic behind traditional pasture management in Pungmo and the ways in which the local people take advantage of seasonal differences by keeping houses and fields in settlements at different altitudes, and through rotational grazing of livestock in different pastures, such as Kunasa and Pungphu. Decisions on the movement of animals from one pasture to another are made by groups upon the advice of Lamas and are determined by quality of grass or other factors, such as weather or biting insects. In October, livestock are brought back to the village from Kunasa and Pungphu. In this case, Kunasa and Pungphu refer to a general area as well as to specific pastures. Although only about one-third of the 30 households graze their livestock in Pungphu, all of the households jointly own houses and fields in Kunasa settlement. In 1997, the wealthiest household owned 14 male yaks and two horses (McKnight 1997). More recently, owing to the high returns from the yarcha gunbu trade, the number of horses and yak has increased.

Dynamic and semi-arid ecosystems such as Dolpo require flexibility in herd size and movement to take advantage of varying forage production due to erratic rainfall (Miller 1993 as cited by McKnight 1997). Opportunistic strategies, such as adjusting herd sizes according to the year's forage production, have long been used by herders to adapt to situations like those in Dolpo (McKnight 1997). A holistic approach to rangeland management, integrated with forest use and agriculture and based on local herders' knowledge about local vegetation and dietary needs and habits of livestock, is crucial for the effective management of pasture.

In addition to their importance as watersheds, habitat for plants and wildlife, forage for livestock and wildlife, and areas of recreation for tourists (McKnight 1997), remote rangelands are important as 'ney', or places of pilgrimage, for local communities (Ghimire et al 1999, 2000). The pasture of Kunasa is considered a 'beyul' (sacred hidden land) by the Bonpo communities of Phoksundo.

A number of relevant studies have been made of different forms of indigenous resource management and their effectiveness, especially in the case of forest and pasture resources. However, research efforts highlighting the coexistence and relation of medicinal plants and pasture resources, and their corresponding management, are lacking; as is research on how people relate to medicinal plants and other pasture resources within social and cultural contexts.

Medicinal plants in Dolpo

Medicinal plants in Dolpo are crucial for both human and animal health. Some information on the importance of medicinal plants for health care in Dolpo has been generated by different studies (Jest 1975, Gurung et al. 1996, Bauer 1999). 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' profession (traditional Tibetan doctor), aimed 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 different researchers working within this programme over the last five years. These investigations are compiled in different reports (Shrestha et al 1998, Parajuli 1998, Ghimire et al. 1999, 2000, 2001) and in a recently published book entitled *Medicinal Plants of Dolpo, Amchis' Knowledge and Conservation* (Lama et al. 2001). The research methodology included methods used in applied ethno-botany (Martin 1995, Cunningham 2001), social and anthropological techniques such as participant observation, standard botanical and ecology surveys,

and participatory rural appraisal (PRA), including drawing of resource use maps and rapid vulnerability assessments (Lama et al. 2001).

Medicinal plant trade is a relatively recent activity in Dolpo. Although trade of small quantities of medicinal plants is a secular activity throughout Nepal and the Himalayas (Dobremez 1976, Edwards 1996, Olsen 1997, 1998), the expansion of this trade is due to the large expansion of the Ayurvedic, Siddha, Unani, Chinese, and Tibetan traditional medical systems throughout the region; as well as the worldwide trend for phytotherapy and natural products. The opening of the airstrip in Juphal, Dolpa, and of an airstrip in the neighbouring district of Jumla were accompanied by an increase in the trade of medicinal plants in Dolpa. Collection of medicinal plants for commercial use is strictly forbidden inside the park, but small quantities for health care can be collected. Dolpo amchi, five of whom reside in Lower Dolpo in Rigmo, Pungmo, and Kaigaon, and 45 of whom live in Upper Dolpo, have identified more than 400 species of medicinal plants that are currently used in their pharmacopoeia (Ghimire et al. 2001, Lama et al. 2001). Regardless of restrictions, most households in Dolpo collect yarcha gunbu from pastures above 4,500m for trade. In the southern buffer zone area of the park, very large quantities of some 20 species of medicinal plants are being collected, and there are many signs of over-harvesting (Ghimire et al. 2000, 2001).

Kunasa: a high pasture of Pungmo

The settlement and life in Pungmo

Pungmo is one of the major settlements of Phoksundo Village Development Committee (VDC), located in the upper part of Lower Dolpo. The other major villages in Phoksundo VDC are Rigmo and Rainchi. Pungmo has a total of 30 households, and 159 inhabitants (73 males and 86 females). Pungmo and Rigmo are major Bonpo areas in Lower Dolpo.

Pungmo's customary lands comprise two major watersheds (Figure 1), Pungphu watershed extending north of the village, and Kunasa watershed northwest of the village. Although not formally owned, such territories are delimited by landmarks recognised by all inhabitants of Pungmo and neighbouring villages. Two smaller settlements, Phu Gumba (three households and one monastery) and Punikha (approximately five households), are located high above the river-banks of the Kunarong River.

While the people in most villages of Dolpo migrate to settlements in the south during winter, the people of Pungmo move up-valley to the settlement of Koiru between mid-February and mid-April, after the Tibetan New Year (Figure 1). There, they take advantage of longer sunshine and good forage availability for their livestock; they return to Pungmo in time to plant crops. Table 1 shows the working calendar of Pungmo inhabitants, especially women. Men are primarily responsible for ploughing, harvesting, and threshing. During the summer much of their time is spent in trans-Himalayan trade. Young men who do not accompany the trade caravans often accompany women in the high pastures.

During the winter months, if there is heavy snowfall or insufficient forage, animals are kept on the ground floor of their owners' houses and are fed with hay and porridge made of flour, grain husks, water, salt, and used tea leaves. In mid-April, the villagers

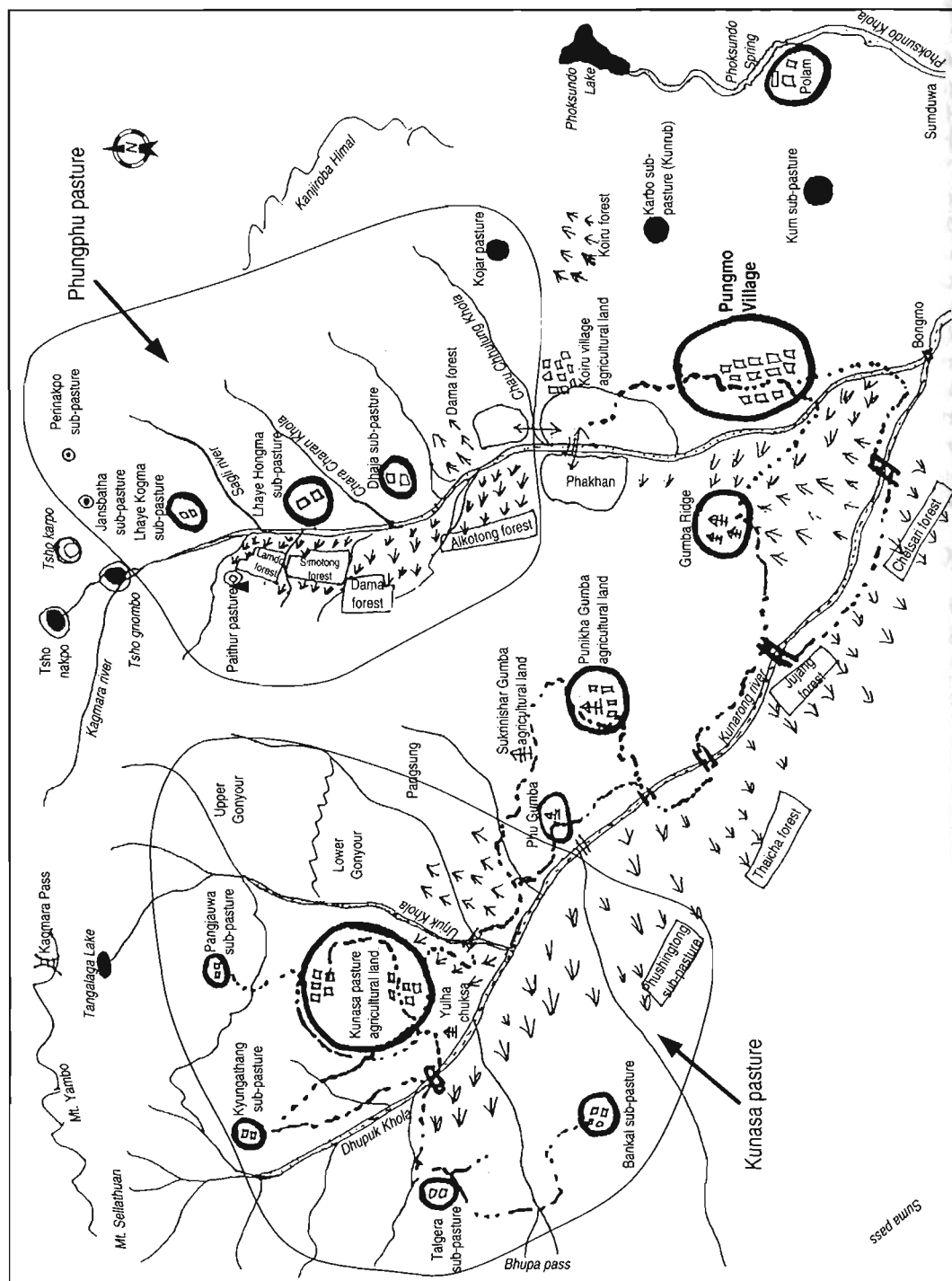


Figure 1: Pungmo's customary lands

Table 1: Working calendar of Pungmo women

Area & activities	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April
Ag. & others <u>Kunasa</u>	Plant wheat, barley, and potato	Weed and weave				Collect 'gains' (snow grass), harvest buckwheat, wheat, mustard, barley, potato	Thresh barley, wheat, buckwheat	Weave				
Herding <u>Kunasa</u>		One woman from each household goes to Kunasa with the livestock and comes back to Pungmo in mid-November. Major activities include accompanying livestock in the different sub-pasture units, milking, making butter and cheese, looking for fuelwood, collecting medicinal plants for the amchis, cultivating fields, and caring for the house and children.										
Herding <u>Koiru</u>									One woman from each household goes to Koiru with the livestock.	Dung is cleaned from the stalls and brought to the fields. After Losar is celebrated, the community moves to Koiru.		Move back to Pungmo to plant fields
Ag. & others <u>Koiru</u>	Plant wheat					Harvest	Thresh					
Ag., fodder, & others <u>Pungmo</u>		Plant buckwheat, wheat	Weed	Weave & collect fodder grass	Collect grass in Pungmo and nearby forests							

move back to Pungmo to plant their crops. Male yaks are kept in Koiru to graze, while other animals are brought to graze in and around Pungmo. The male yaks are grazed in Pungphu until it is time for the trans-Himalayan barter trade in late June. In early June, yak, 'dri', 'dzomo' (female yaks and yak-cattle hybrids), and 'dzo' (male hybrids) are taken to high-altitude pastures in Kunasa and Pungphu settlements, where they are grazed for the entire summer, thereby enabling the low-altitude pastures near the village to regenerate (McKnight 1997, Parajuli 1998, Ghimire et al. 1999).

Kunasa, including Gumba and Punikha, is the major pasture area of Pungmo. Twenty-eight households in Pungmo rear livestock; of these, only five households take their livestock to the Pungphu watershed, while the remaining 23 take their yaks and yak cross-breeds to Kunasa. A total of 206 yaks graze in Kunasa.

History, socio-cultural dimensions, and management system

The founding father in search of a hidden valley

Elements of oral history date the foundation of Pungmo to about 10 generations back (approximately 300 years ago), with the arrival in the area of Tretton Sikyal Sambo. Whether he was the first person to arrive in the area is not quite clear, but the story says that the first person who arrived in the area was looking for a place for religious retreat. He arrived in Kunasa, a high valley tucked up in the mountains, and reached a large rock quite centrally located in the overall glacial moraine landscape. He was carrying a sacred dagger; he hit the rock, and a miracle spring started flowing out. This place is called Lama Tchumik, and once a year, pilgrims from Pungmo, Rigmo, Rainchi, and Dho Tarap converge here for a major religious ceremony.

It is thought that the neighbouring village of Rigmo was established two centuries ago (Richard and MacLeod 1994). Kunasa was certainly the first pasture area used by the Pungmo people, based on the local belief that the area was first colonised by Lamas for religious reasons and that these Lamas were accompanied by a few families⁶.

There are signs indicating that Kunasa has a long history.

- There are many monasteries located along the route to Kunasa, namely Yungdrung Chhungmo, Tshelling, Tshekhching Rapkaling, Punikha, Timgang, Salahot, Sugrinishar, and Saikhangpalgi. Some of these monasteries are privately owned by individual families, while others are communal monasteries.
- Retreat caves are carved out of the morainal depositional cliffs bordering Kunasa. These caves are said to be very ancient and were used for religious retreat.
- In Kunasa, the existence of important religious landmarks like 'mani' (chains of flat stones with religious scriptures) and 'chortens', such as the Yulha Chulsa, which represents the house of the village god, have been in the area as long as people can remember. In Pungphu watershed, the Yulha Chulsa was established only in 1999.

⁶ The idea that Dolpo was colonised primarily by religious people looking for an area for retreat has been discussed by Snellgrove (1992).

⁷ A chorten is a religious construction with a square base and pyramidal shape made of rocks simply piled up, or built up with mud or similar and covered with traditional plaster and religious ornamentation such as paintings, scriptures and esoteric signs. Chortens always contain religious relics such as texts, the bones of famous lamas, or other artefacts.

Kunasa (4200m) is characterised by the existence of a very large agricultural field located on the flattest part of the glacial moraine deposit, which is commonly owned by all the villagers of Pungmo; this area is surrounded by a stone wall, which protects the fields from animals. Even villagers who only bring their livestock to Pungphu have agricultural land in Kunasa. Two settlements, Pangdang in the southern part of the agricultural land and Lhayé in the northern part, are used by families from Pungmo, Phu Gumba, and Punikha. Some members of each family stay in Pungmo, Phu Gumba, and Punikha, while others spend the summer at Kunasa. The houses in Pangdang and Lhayé are permanent constructions and each house shelters a group of families, generally brothers and other close kin. The groups from Pangdang and Lhayé move their herds separately as described below.

A cultural and religious landscape

Understanding how people name places and how they relate to these places constitutes a major part of understanding how they relate to their land. All practices including, but not limited, to management are highly related to local spatial references, whether symbolic or material. Kunasa is a huge area, whose limits can't be seen when standing in one place. The major sub-pastures of Kunasa have been named according to topography and land morphology (Figure 2), or in relation to types of vegetation, plant species, or animals characterising the area. These sub-pastures are generally isolated from each other by natural barriers, such as ridges or rivers, or by manmade barriers or religious marks, such as 'mani', 'laptai' (piles of stones with a pyramidal shape erected at the top of mountain passes or the entry to a village or pasture area, where visitors offer flowers to the local deities inhabiting the area) or 'tho' or 'thobo' (cairns arranged in a line along a ridge which stick out of the snow in winter). These are meant to keep away dangerous animals or evil spirits from the settlements. Local place names can be a good indicator of how people relate to their landscape. The local place names in this area have been studied in some detail. Names are given to all places, including pastures, sub-pastures, and forests. Pastures are called 'penhri', and different types of penhri are identified and named according to the names of mountain cliffs and rivers, and sometimes according to the nature of terrain and plant species. Penhri-chongba-tong, a sub-unit of Lhayé-Kogma sub-pasture in Pungphu, refers to a square area which has very flat topography and has good-quality grass species. Penhri-karpo and Penhri-nakpo are sub-units of the same sub-pasture, and look white and black, respectively, from a distance. Penhri-sopa, in the same area, refers to a meadow shaped like a human shoulder.

Similarly, Talgera sub-pasture in Kunasa (Table 2) refers to a place having ladder-like terraces. Kyunga-thang sub-pasture in the same area represents the 'kyunga' (a mythical Tibetan bird) and refers to the high altitude of the pasture, symbolically inhabited by the kyunga, and the fact that it is relatively flat land ('thang'). The name Pangjauwa, another sub-pasture in Kunasa, is based on the quality of fodder grass available in the pasture. It is derived from two words; 'pang', meaning pasture, and 'jauwa', meaning good or fine. Thus, literally, Pangjauwa means the pasture-land where fine or good-quality grass is dominant. Bankal sub-pasture refers to the plant 'baghan' (*Megacarpa polyandra*), which is found only in that area. Dhowo-penhri, a sub-unit of the Bankal sub-pasture, refers to the medicinal plant found in the area, 'pangtsi dhowo' (*Pterocarpus hookeri*). Similarly, the sub-unit named Uiri in the same pasture refers to the grazing area at the centre of the sub-pasture. Chulung is a sub-unit of Bankal sub-pasture that means 'grazing ground fed by mountain streams'.

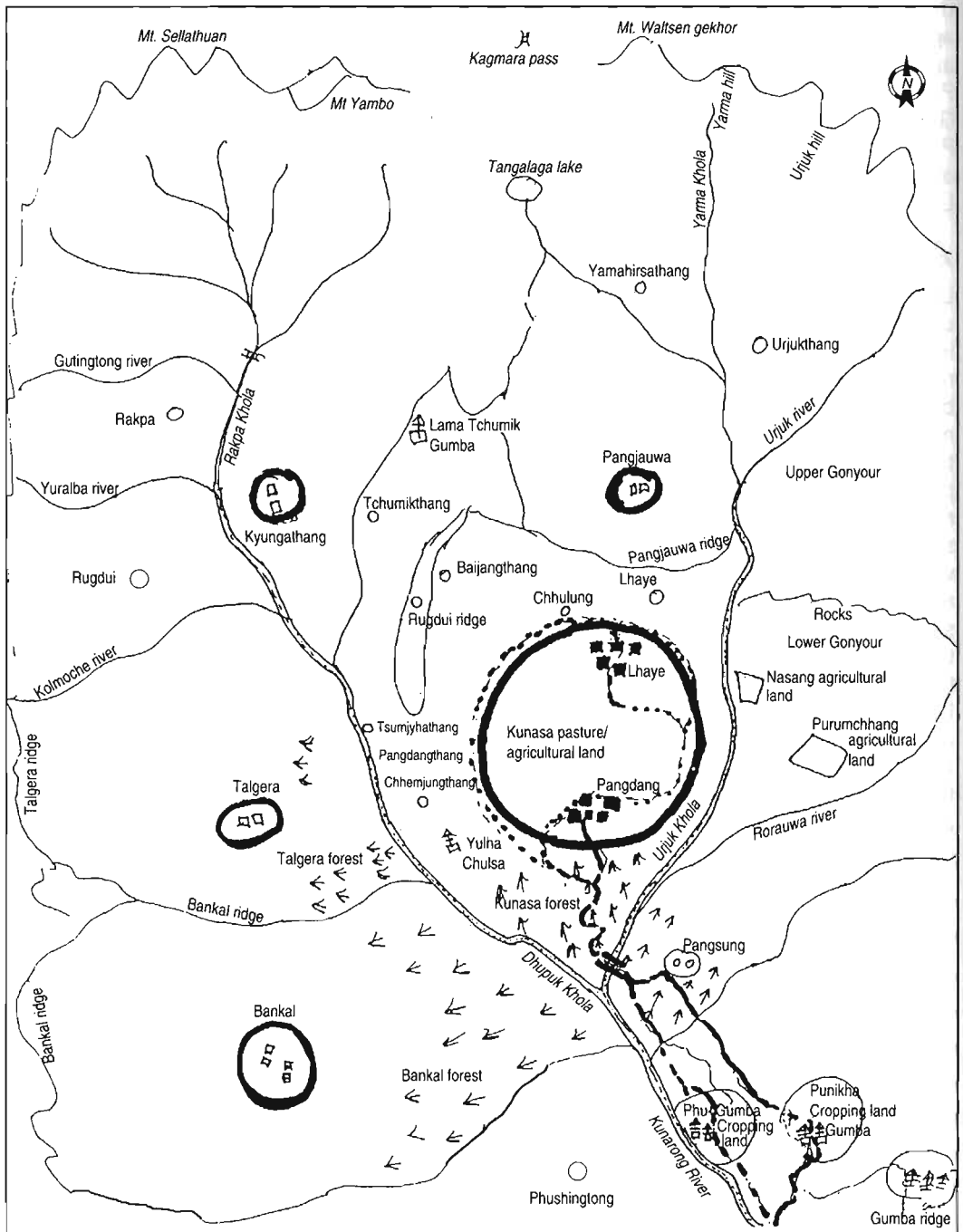


Figure 2: The Kunasa area

Table 2: Sub-pastures of Pumphu, Kunasa, and Bankal pastures

Penhri-chongba-tong	Sub-unit of a sub-pasture of Pumphu	This name refers to the fact that this pasture is flat and square in shape and has good-quality grasses.
Talgera	One of the four major sub-pastures of Kunasa	This name refers to an area having ladder-like terraces.
Pangjauwa	One of the four major sub-pastures of Kunasa	This name refers to the good grass quality found there.
Kyunga-thang	One of the four major sub-pastures of Kunasa	This name refers to the bird kyunga and to the relatively flat area.
Bankal	One of the four major sub-pastures of Kunasa	This name refers to the plant baghan, only found in that area.
Dhowo penhri	A sub-unit of Bankal	This name refers to the medicinal plant pangsi dhowo found in that area.
Chulung	A sub-unit of Bankal	This name refers to a grazing ground fed by mountain streams.

Source: Ghimire et al. 1999

Besides topographical characteristics and vegetation types, the overall pasture landscape has landmarks relating to the cultural and religious links established with the land over many generations. During the ceremony of Yulha Chulsa in May, this relationship is demonstrated in the form of a religious ritual. Ceremonial cakes ('torma') are made in the effigies of the local deities 'lha', 'shidag', and 'lu', who reside in the landscape and wield power over the environment and the lives of people and livestock. These effigies also include rocks with special features. One such rock is 'singhatong', which resembles a lion and also elements of three circumambulation routes – 'nangkör', the inner circumambulation around Lama Tchumik; 'barkör', the middle circumambulation path; and 'lingkör', circumambulation of a very large area of Kunasa with specific landmarks embodying different aspects of local religious folklore. The landmarks include 'Khandroi numä', or goddess breast (a rock with this shape), where pilgrims stop and drink water; and 'Mandal thang', where there are many torma-like structures in rocks, and at which pilgrims stop to offer fruits and flowers. During the Yulha Chulsa ceremony, the names of these places and special features of the landscape are recited during the act of molding the effigies, thus embodying through ritual a very strong relationship with these different elements. Similarly, during the Lama Tchumik pilgrimage, walking around in groups, making offerings, praying, and dancing all contribute to the ancestral link of these people to their area. The ceremony of Yulsa Chulsa, which is portrayed in a film made in Dolpo (Aumeeruddy 2000), shows how people from older generations through rituals, practices, and ceremonies convey the sense of belonging to an area to younger generations and ascertain their relationships to their land, as well as to all elements natural and supernatural⁸ that are a large part of their life. Kunasa is very characteristic of the concept of 'ney' or 'beyul', meaning hidden land, and is interpreted as such locally. Being a meditation site for Lamas, the Kunasa area has been historically considered a sacred place. Within the Kunasa area, nine gombas have been established by the late Lamas and local people for religious and educational purposes. These settlements are surrounded by agricultural lands, forests, pastures, and scrublands.

⁸ There is no division between natural and supernatural in this society, both dimensions being intertwined in everyday life.

Decision-making systems in Pungmo

Two main local institutions have been identified by Parajuli (1998) as responsible for overseeing all activities related to the use of pastures in Pungmo. These are the 'dratsang' and 'yulgigothe'. Dratsang is the Lama hierarchical system that used to govern a very large area extending beyond Pungmo. Lamas, who were not only religious heads, but also dynamic agro-pastoralists, used to control and manage these lands; collect nominal taxes; and fine encroachers on forest, pasture, and agricultural land. However, this system was partly dismantled with the extension of the talukdari system after 1911. The dratsang was replaced with the mukhiya (talukdar), who was appointed by the king to collect taxes and revenue and to be responsible for law and order in the area. Although neither the mukhiya nor the lamas are formally recognised by present government policy, Parajuli (1998) considers them to have combined their customary strengths and to still be responsible in the village context for making all decisions relating to pasture and forest management. Since the establishment of the National Park, these local authorities have lost any prerogative to fine external persons who encroach or 'illegally' collect forest or pasture resources, but a relatively high level of control over rotational patterns of herds is still maintained within the community.

Special permission was required in the past from the head lama to collect timber from the forests, graze livestock in the pasture, or harvest medicinal plants. Today, although people may still ask permission to collect timber, the real authority regarding timber collection is the National Park, and people from any village in the park may collect from the forests of Pungmo, providing they pay royalties to the park. The dratsang and yulgigothe still determine the dates of movements of livestock between different pastures and the harvesting of pasture resources. Harvesting of other pasture products, such as fodder grass for winter ('gainsi') and medicinal plants, were traditionally performed only when lamas announced the date for public harvesting, which was after the 'tahangsung rikhi' or 'nectar rains'. This is a period in the Tibetan religious calendar at the end of October when some very fine local rains increase the potency of plants (potency can be interpreted as nutritive contents for fodder grasses and active principles for medicinal plants). After this, fodder grasses, and roots and rhizomes of medicinal plants which have already set seeds, were collected in the high pastures. Before the tahangsung rikhi, local people were not allowed to cut grass from the pasture. If necessary, they could harvest from their private land by uprooting, but not by using any metal tools. It was believed that if metal tools were used before tahangsung rikhi, the climate would change and frost would occur, damaging the cultivated crops. It was also believed that grass harvested before the tahangsung rikhi turned black and rotted easily, and therefore became less nutritious for cattle. Monks ('drawa') patrolled the resources and pastures at least once a month, and violators were fined in cash (100 silver coins) or in kind (grain) (Parajuli 1998, Ghimire et al. 1999).

The gomba system of resource management, once prevalent in the whole Phoksundo area, became confined to the Kunasa area after the extension of the yulgigothe or talukdari system in 1911 (Parajuli 1998).

Generally, the tasks of the mukhiya were guided by the traditional rules and regulations formulated by the lamas of the dratsang. Every year, the mukhiya appointed two 'tohremas', or volunteers from among the members of two different families, on a rotational basis. Each family knew about their turn in advance. The

tasks defined for the tohremas were very similar to the tasks of the monks (drawas) of the dratsang system; therefore, they sometimes worked together or alternately while patrolling the resources. In addition, the mukhiya, in cooperation with other members of the yulgigothe, determined the dates or periods of crop cultivation and harvesting of crops and other resources from the specific area. The tohremas informed all the villagers of this decision, and the people performed the specified activities in a specific period and place. The provision of fines was also prevalent in this system of management in cases of transgression of rules. Fundamentally, except for agricultural land tax collection, the mukhiyas did not bring any changes to the role of lamas regarding the control and management of natural resources within the lama territory. Since the mukhiyas were well educated and respected among the villagers, they even helped the lamas in maintaining social, cultural, and religious cohesion in Pungmo village, as well as in the Kunasa area, by implementing traditional rules and resolving disputes. Therefore, it seems that these systems were reciprocal systems for natural resource management. The yulgigothe system remained for a few generations and theoretically ended in 1996, with the government's new arrangements for local revenue collection by the VDC authorities. However, the local people have maintained the traditional methods of revenue collection by the mukhiya, who collects the revenue and deposits it at the VDC. Thus, the mukhiyas have remained, though informally, a kind of liaison officer with the government.

Relationships of this type between the village customary chiefs and the village lamas have not been described elsewhere in Dolpo so far. There are mukhiyas in all the villages of Dolpo. All the lamas in Lower Dolpo are originally from Pungmo; many other lamas and other religious people – among them some 45 amchi – live in the villages of Upper Dolpo. The work undertaken to date in this area does not enable us to establish clearly the exact role that the religious people and the mukhiyas play in relation to resource management in other villages in Dolpo.

Present system of pasture management

Today in Pungmo decisions concerning when to move from lower winter pastures to Kunasa or Pungphu are built on a consensus between the lamas, the mukhiya, and the elderly persons of the village. The decision to divide the whole village into two groups, Pungphu (5 families) and Kunasa (23 families), was made to avoid overstocking of pastures, but may have also been related to other social issues, especially family alliances.

A number of sub-pastures are used in the larger Kunasa area, including pasture units located immediately around the agricultural field, and the more distant pastures Pangjauwa, Bankal, Talgera, and Kyungathang (see Figure 2). Herds are brought from the lower winter pastures in Pungmo to Kunasa in May. People living in Lhayé, the higher settlement, graze in different sub-pastures located to the east of the upper part of the agricultural fields, whereas people living in the lower settlement of Pangdang graze their herds in the sub-pastures closer to their settlement. Distant sub-pastures such as Bankal, Talgera, Kyungathang, and Pangjauwa are closed until July.

The general pattern of looking after the herds is as follows. Herds are brought by groups of women living in the same house and are left to graze in pasture units where other herds are not grazing. Thus, there is a clear strategy to spread the impact of grazing as much as possible in each pasture unit. In July, people leave the main

settlements and go to reconstruct secondary settlements. These are non-permanent constructions set up in pastures far from the central agricultural fields and the main settlements of Lhaye and Pangdang. People from Lhaye go to Talgera, and people from Pangdang go to Bankal. At the end of July, each group leaves the secondary settlement: the people from Talgera go to Pangjauwa, while those from Bankal go to Kyungathang. Talgera and Bankal are then closed to grazing. Herds are kept in Kyungathang and Pangjauwa until approximately mid-September, after which they are brought back to pastures adjacent to Kunasa's agricultural fields and are grazed again in the pasture units of Kunasa itself, as well as in Lower Gonyour, which is closed from May to September to allow collection of wild garlic and grass for winter (Parajuli 1998). Figure 3 shows the rotational pattern in Kunasa.

Vegetation status of different sub-pastures and medicinal plant distribution

As described by Dobremez (1976), Himalayan vegetation types (alpine, sub alpine, temperate, and others) are characterised by a large number of habitats and microhabitats; and the higher up, the larger the number of habitats and microhabitats. The principle of rotational grazing is a system by which people shift animals from one sub-pasture to another and from one pasture unit to another to allow maximal utilisation of the diversity of resources available. In this case, north and east-facing areas are often invaded by *Rhododendron*, thick bushes allowing little space for grasses; whereas south and west-facing areas have a diversity of grass species from the Poaceae family, and in the highest pastures, an abundance of sedge species, principally *Kobresia*.

Above the timber-line, the vegetation is typical alpine scrub and meadow. The region is characterised by severe winters and very short cold summers. Precipitation is low and comes in the form of snow and scanty rain. In the lower alpine belt, north and north-west facing areas are often invaded by shrubs; mainly Ericaceae (*Cassiope fastigiata*, *Rhododendron anthopogon*, and *R. lepidotum*), Salicaceae (*Salix calyculata* and *S. lindleyana*), Rosaceae (*Potentilla fruticosa*), and Grossulariaceae (*Lonicera spinosa*); forming closed extensive thickets where graminoids and other herbaceous vegetation rarely grow. On the other hand, south and south-east facing areas have a diversity of Poaceae species, including *Danthonia* spp., *Deyeuxia* spp., *Festuca* spp., *Kobresia* spp., *Melica* spp., *Poa* spp., and *Stipa* spp. Southern aspects also support scattered patches of woody vegetation, the most frequent of which are *Juniperus indica*, *J. squamata*, *Chesneya nubigena*, *Berberis* spp., and *Ephedra gerardiana*. Besides these, pasture vegetation is comprised of various herbs, such as *Aconitum spicatum*, *Anaphalis triplinervis*, *Bistorta affinis*, *Geranium donianum*, *Geranium pratense*, *Iris* spp., *Ligularia* spp., *Meconopsis paniculata*, *Pedicularis* spp., *Podophyllum hexandrum*, *Sedum* spp, and *Stellera chamaejasme*.

Pastures of the lower belt are dominated mostly by different species of *Agrostis*, *Arundinella*, *Cymbopogon*, *Deschampsia*, and *Festuca*. Species such as *Morina polyphylla*, *M. nepalensis*, and *Rumex nepalensis* are indicators of pasture quality, as they dominate heavily-grazed and more disturbed habitats. Along streams and riverbeds, the vegetation characteristically consists of *Myricaria rosea* and *Salix doltoniana*. Above these scrub communities, the vegetation consists of vast stretches of open, moist or semi-arid, alpine meadows, mainly comprised of *Kobresia seticulmis* and *K. trinervis*. Associated species in these meadows are *Agrostis munroana*, *Androsace strigillosa*, *Carex* spp., *Cortia depressa*, *Geranium donianum*, *Iris* spp., *Lagotis kunawurensis*, *Potentilla pedunculosa*, and *Primula* spp. Above 4800m, plant

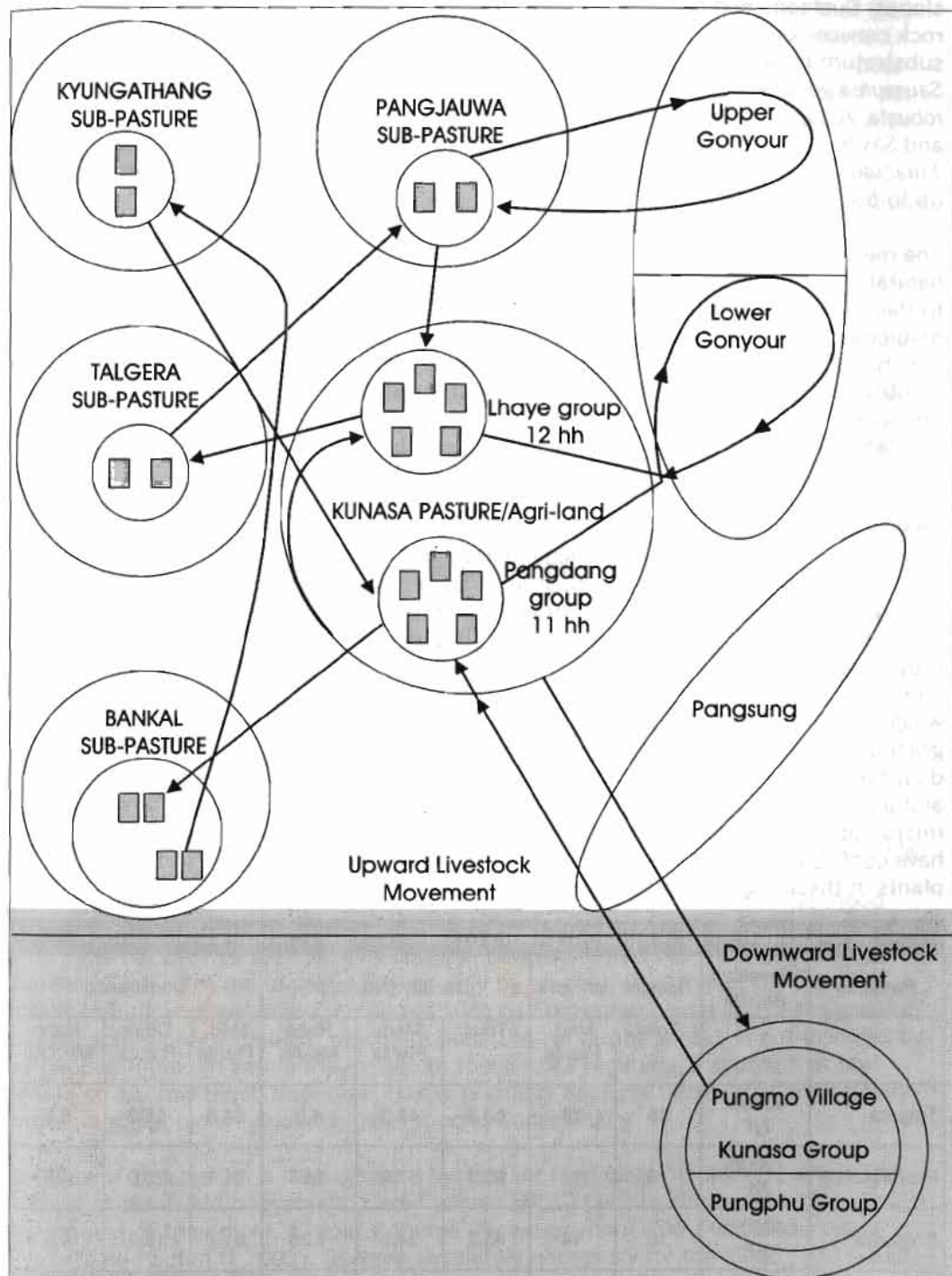


Figure 3: Sub-pastures in the Kunasa area; arrows show the rotational pattern
(Source: Parajuli 1998)

associations diminish and appear scattered on the exposed rocky screes and stony slopes. Cushions and dense mats of flowering plants are mostly crowded together in rock crevices or close to boulders, where they are sheltered against the daily substratum movement. The most common pioneer species are *Rhodiola himalensis*, *Saussurea gossypiphora*, and *S. graminifolia*. Some associated species are *Androsace robusta*, *A. tapete*, *Arenaria polytrichoides*, *Primula minutissima*, *Saxifraga macrophylla*, and *Saxifraga stenophylla*. In the drier parts, species of *Arenaria*, *Cortiella*, and *Tanacetum* form multi-species cushions. These alpine herbs remain quite prominent up to 5300m.

The medicinal plants present in Kunasa occupy a large range of habitats and micro-habitats. The local people do not intentionally manage medicinal plants, possibly due to their very large accessibility. Knowledge about the precise distribution of all medicinal species is mainly held by the lamas, especially those who are professional 'amchi'. However, women, who spend more time in the pastures than do men, can identify a large number of species and are often asked by amchi to collect certain medicinal plants. Lay people use only a small range of species compared to amchi and lamas, who collect some 400 species of plants for medical uses. The main species collected by lay people are those with multiple uses.

Analysis of the species richness and dominance of medicinal plants in different sub-pastures shows that the ratio of medicinal plant density to associated species density is lowest on south-facing slopes, such as in Upper Gonyour, where there is a very low dominance of medicinal plants compared to other species. This tendency is reversed on north-facing slopes such as in Talgera. Although these results are only indicative, they suggest that since south-facing areas are under higher grazing pressure, communities may have evolved in these areas with higher proportions of graminoids – which are possibly less vulnerable to trampling and which grow back readily after grazing – and lower proportions of other herbs. However, after examining the distribution of medicinal plants in the various sub-pastures with different altitudes and aspects, one may also argue that it is the very high diversity of habitats and micro-habitats provided by rugged terrain, in addition to low grazing pressure, which have contributed to the long-term maintenance of the great diversity of medicinal plants in these high pastures (Table 3).

Table 3: Distribution of medicinal plants in different sub-pastures of Kunasa

Pastures	Elevation/ Aspect	Species richness		Density (No./m ²)			Dominance		
		Total	Med. Plants	Total	Med. Plants	Ratio Mp:As	Med. Plants	Other Plants	Ratio MP:Oth
Talgera	4250m NF	35	28	53.3	44.2	4.9	84.8	15.2	5.6
Pushing-tong	4200m NF	18	13	95.7	57.9	1.53	61.1	39.0	1.6
Shotoriya	4300m EF	16	14	43.2	24.9	1.35	81.7	18.3	4.5
Upper Gonyour	4500m SF	34	27	77.9	26.5	0.51	40.0	60.0	0.67

NF = north-facing; EF = east-facing; SF = south-facing; Med. = Medicinal

Source: Ghimire et al. 2000

Looking at the overall conservation status of two major medicinal plants, *Nardostachys grandiflora* and *Neopichrorhiza scrophulariiflora*, Ghimire (2000, 2001) found that the two species occupy different habitats in the pastures. *N. grandiflora* prefers south-facing slopes, while *N. scrophulariiflora* prefers more moist, northeast-facing slopes. Densities of *N. grandiflora* varied from 30.4 per sq.m in the remotest sites to 4.7 per sq.m. It is also notable that *N. grandiflora* was completely absent from all areas with very high grazing pressure. Since no large scheme of commercial collection is conducted at either of these sites, and the two habitats are relatively similar, one could say that *N. grandiflora* is affected by low grazing pressure and might completely disappear under high grazing pressure. Comparison of densities of *N. scrophulariiflora* at two sites showed that they are higher in Talgera (1.90 per sq.m), characterised by relatively high grazing pressure, than in Phushingtong (1.80 per sq.m). However, the frequency of *N. scrophulariiflora* is higher in Phushingtong. Both sites are characterised by relatively rugged terrain and high coverage of *Rhododendron* bushes. The maintenance of *N. scrophulariiflora* in these areas could be interpreted as being a result of vegetation structure and rocky terrain, which offer small micro-habitats for this plant. Moreover, Ghimire (2000) interprets the difference between these two species as being a result of the different vegetative growth patterns of the two species.

Management of medicinal plants in relation to pastoral activities

Most of the medicinal plants collected in Kunasa are collected in very small quantities by the amchi. Management of medicinal plants by amchi – including quantities of various plant parts collected – is based on knowledge of plant life cycles, distributions, variations in population size, and regeneration abilities. The amchi tend to collect medicinal plants with care, avoiding over-exploitation of specific populations and changing harvest sites when they consider populations to be losing vigour. Other harvesting pressures may be due to collection by lay people, either for self-medication or for incense, fodder, firewood, or dye.

No particular regulatory system exists to protect medicinal plants from damage caused by herding activities, which are based on rotational grazing, deferred grazing in certain pastures, and the spreading out of herds in the largest possible area to avoid over-stocking. These activities are important to maintain the local livelihood system. A few general rules exist, such as the use of the religious calendar to determine the best periods for harvesting underground parts of medicinal plants. However, such rules are usually followed only by amchi. For example, the rule that entails leaving younger bulbs of species such as *Dactylorhiza hatagirea* in the ground and collecting only old bulbs, which are bound to rot during winter, is not followed by lay people. Although amchi may spell out these rules regularly, it seems that lay people do not pay much attention. This is probably because these rules are not very formal, and people only collect these species occasionally.

Because of this lack of a management system for medicinal plants, and within the context of the Traditional Health Care Centre (THCC) built in Phoksundo VDC upon the request of the amchi, a rapid vulnerability assessment (RVA) was undertaken (Tripathi and Schmitt 2001). Species absolutely necessary for the clinic (136 species) were filtered on the basis of amounts used, parts collected (collection of underground parts or whole plants is considered the most damaging), distribution (highly site-specific species are under higher levels of threat), and number of user groups (the more diverse the user groups, the more difficult it is to ensure control

over the resources). Twenty-four species were found to be potentially vulnerable to over-harvesting (Tripathi and Schmitt 2001) and to require development of very specific harvesting practices and a clearly defined monitoring system. The amchi of the THCC were asked to reconsider these 24 species in June 2003, and to further short-list these species based on habitat specificity (endemism, rarity), possible impact from illegal trade, regeneration potential, and parts used. Precise localities of occurrence for species on the resulting list of ten were established, and scores of occurrence were assigned based on local categories of availability. These ten species are listed in Table 4. The amounts found during the vulnerability assessment were the amounts that a group of amchi gave as needed by the clinic.

Table 4: Species found to be potentially vulnerable and currently monitored by the THCC and the MPMC (Tripathi and Schmitt in Ghimire et al. 2001)

Scientific Name	Parts ¹	Amount required by THCC (kg/yr) based on the RVA ²	Harvesting Season (English and Nepali months)
<i>Dactylorhiza hatagirea</i>	Rt	1	Oct.–Nov. (Kartik)
<i>Nardostachys grandiflora</i>	Rh	4	Sept.–Nov. (Ashoj-Mangsir)
<i>Arnebia benthamii</i>	Rt	4	Nov.–Dec. (Kartik-Mangsir)
<i>Incarvillea mairei</i>	Fl, Lf, Rt	0.5	June-July (Ashad) – fl, lf Oct.–Nov. (Kartik) – rt
<i>Neopicrorhiza scrophulariiflora</i>	Rh	4	Sept.–Nov. (Ashoj-Mangsir)
<i>Corydalis megacalyx</i>	Fl, Lf	1	June-July (Ashad)
<i>Corydalis cashmeriana</i>	Fl, Lf	0.5	Aug.–Oct. (Shrawan-Bhadra)
<i>Meconopsis horridula</i>	Lf, Fl, Fr	0.25	July-Sept. (Shrawan-Bhadra)
<i>Gentiana robusta</i>	Lf, Fl	3	July-Aug. (Shrawan)
<i>Halenia elliptica</i>	Lf, Fl, St	2	Aug.–Sept. (Bhadra)

¹ Fl = flower, Fr = fruit, Lf = leaf, Rh = rhizome, Rt = root, St = stem

² rapid vulnerability assessment

These ten species will be monitored by the Medicinal Plants Management Committee (MPMC), a body set up in Phoksundo in 2000 and composed of lay people from the village, generally young people interested in learning from the amchi and from the project. This body also includes representatives of the dratsang and the yuldigothe, the institutions previously responsible for these matters. The MPMC's role is to monitor the impacts of use of these species in close collaboration with the THCC. The THCC is also responsible for closely monitoring the amounts of potentially vulnerable species used at the clinic. Both the THCC and the MPMC may play important roles in the future in warning villagers of possible signs of over-harvesting.

Conclusions

The very large pasture areas available, along with a sophisticated rotational system, seem to have thus far ensured the maintenance in Kunasa of high-quality rangelands with diverse medicinal plants. However, based on the data available so far from this project, it appears 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 not be grazed because of toxic chemical components or specific morphological characteristics, such as spiny leaves or twigs, which deter

animals. Resistance of these medicinal plants to grazing may well 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 Kunasa, according to the amchi, none of the major species has yet significantly declined, although species such as *Nardostachys grandiflora* are found in the largest quantities in the remotest areas.

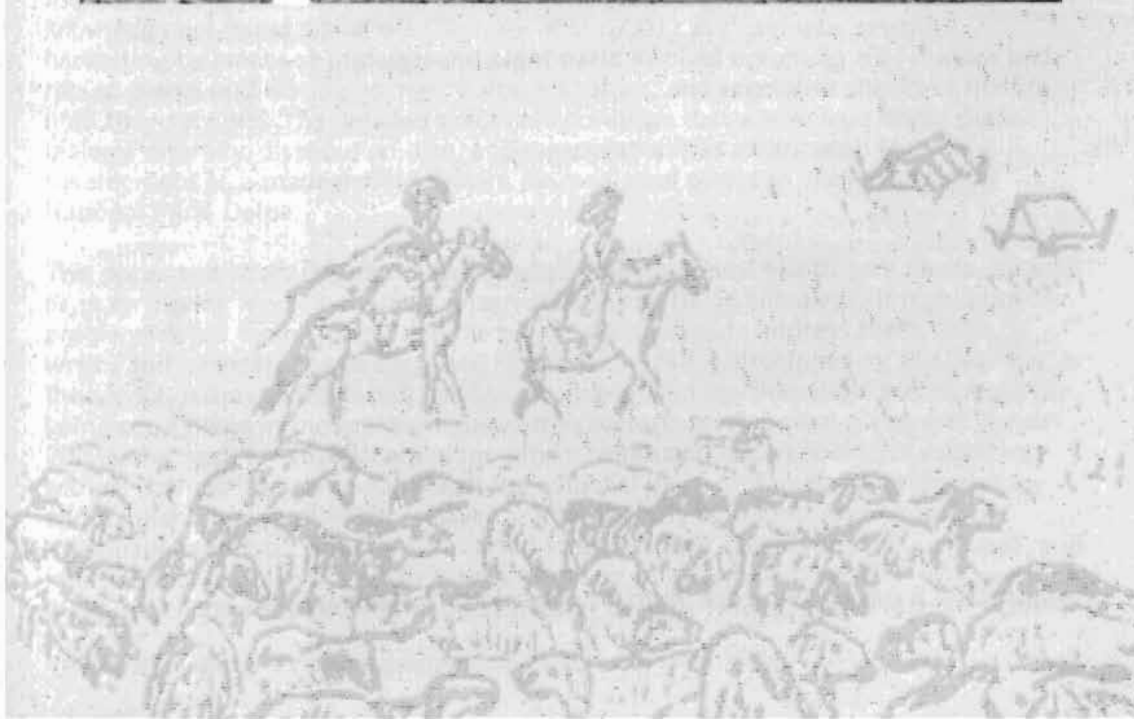
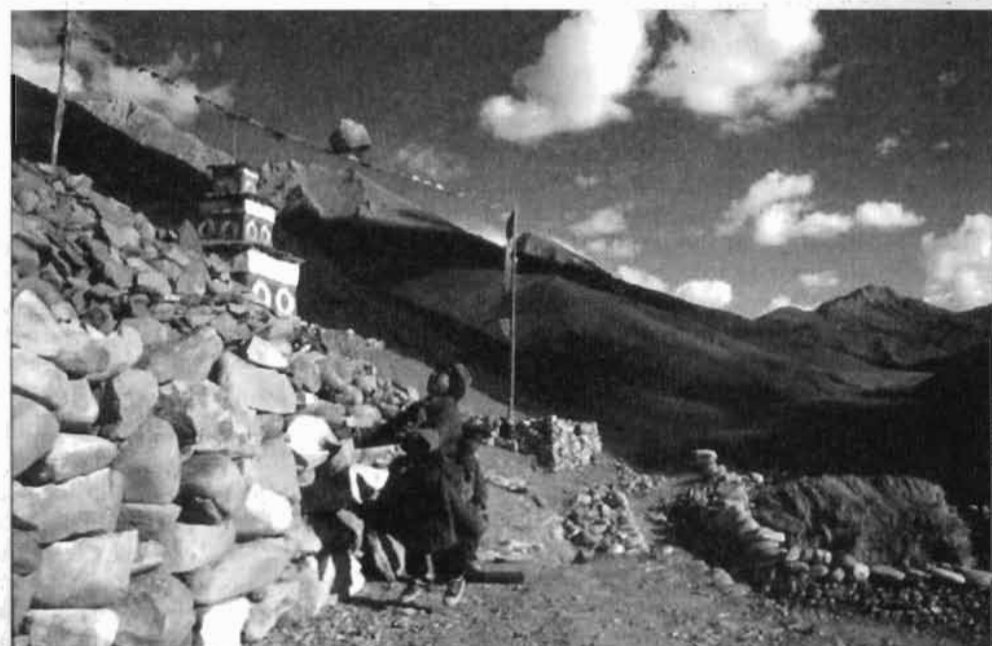
This paper attempts to place medicinal plant management in the overall context of pastoral life, seen here as a social unit. It stresses the need to fit any new management system into the local social and cultural dynamics and to try to articulate these new management systems into the larger context – in this case, the overall management system of the national park. The model of THCC and the functioning of the MPMC have been proposed for inclusion in the management plan of Shey Phoksundo National Park. 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 people living in the area. 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.

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



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

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Introduction

Biomedicine (or allopathy) is characterised by the specialisation of doctors in particular areas of expertise such as paediatrics, obstetrics, surgery, or dentistry. Simply put, a paediatrician treats childhood ailments, a surgeon operates on defective body parts, and a dentist mends decayed teeth. In remote pastoral highlands of Nepal, in districts such as Dolpa, Mustang, Humla, Mugu, Gorkha, and Rasuwa, an 'amchi' (medical practitioner) is very much a doctor – a doctor of multiple skills who provides diagnoses and treatments, but who does not have a license to practice. Although amchi are not recognised by the Ministry of Health, one might find them treating patients in a variety of situations – in private clinics in bustling metropolises, as well as in nomads' tents in the remotest reaches of the Himalaya. Even so, the public perception of traditional medicine is that of an 'alternative', or a 'last resort'. An amchi is not only an alternative or a last resort for the pastoral communities in the Nepal Himalaya; he is all that they have for meeting their health care needs, including those of their livestock (Gurung 1996; Craig 1996; Shrestha et al. 1998).

Amchi are indispensable for the health of pastoral communities, and as a group of specialised knowledge holders, they are crucial to the conservation of high-altitude medicinal plant resources. Furthermore, amchi have botanical and ecological knowledge not found elsewhere (Ghimire et al. 2001). For example, selective harvesting by amchi of underground plant parts involves uprooting only mature and robust plants and leaving younger bulbs, rhizomes, and vegetative shoots to mature until they set seed. The detailed practical knowledge that amchi have about plant biology, diversity, distribution, use, and regeneration has contributed towards development of a management system for medicinal plants in Shey Phoksundo National Park, Dolpa.

This paper examines the role of the amchi in meeting local health care needs, as well as in furthering medicinal plant conservation in the Nepal Himalaya. It highlights the problems faced by the amchi and the ongoing initiatives to address them, both by amchi and by external agencies, and identifies areas for strengthening the capacity of the amchi. Although the terms 'capacity building' and 'participation' are increasingly being scrutinised in the critique against mainstream development (Cook and Kothari 2001), the need for strengthening the amchi profession has been articulated from within. The last decade saw in Nepal the establishment of a multi-party democracy and a mushrooming of NGOs involved with a diversity of issues. Among various marginalised groups, amchi have started to assert their identity in local, national, and international arenas. At a participatory planning workshop held by WWF in Dolpa in 1997, amchi directed the ethnobotany project towards issues related to local health

care and a revitalisation of their profession. That project has made an attempt to link health care to medicinal plant conservation and management. Partnership between the amchi and conservation and development agencies is considered a good opportunity for furthering development and conservation in Nepal.

The amchi tradition and its development in the Nepal Himalaya

An amchi is a practitioner of the 'Sowarigpa' medical system (also practiced in Ladakh, Sikkim, Tibet, and Bhutan), which recognises that disease is caused by imbalance in the three 'psycho-physiological energies', translated as 'wind', 'bile', and 'phlegm'. Diagnostic measures include questioning and physically examining the patient and analysing of the pulse and the urine. Treatments include medicine, moxibustion, venesection (bloodletting), and medicinal baths (Donden 1986, Dummer 1994, Donden and Wallace 2000).

Motivated by compassion (a key principle in Buddhism and Bon and a vehicle for obtaining enlightenment), 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, often with great financial and physical difficulty.

Plants procured from the lowlands (the Terai and India) include *Terminalia chebula*, *Terminalia bellerica*, *Phyllanthus emblica*, *Myristica fragrans*, *Vitis vinifera*, *Cinnamomum tamala*, *Piper nigrum*, and *Piper longum*. In addition, a number of precious metals, minerals, resins, and animals are used by amchi. *Serkyi chema* (literally golden sand) is an important medicinal ingredient that is found in the Kailash-Manosarovar region; amchi in Nepal have difficulty procuring this, as well as other ingredients.

An amchi is summoned to see patients in distant places at all hours of the day and night, throughout the year, regardless of the weather. He identifies the causes of illness and advises patients, in his soothing speech, of the necessary therapy, diet, and behaviour. Finally, he views all of his patients equally, whether they are rich or poor, and uses his knowledge and experience to cure illnesses, from the minor to the major. The amchi of Nepal receive medical training from their fathers (Amchis Gyatso and Tenzing were trained in part by their late father, Amchi Tashi Chusang) or teachers. It is not unusual for students to travel to distant villages to study with experienced teachers, from whom they learn the identification and use of medicinal plants and other substances. By accompanying the teacher or father on visits to patients, students learn about diagnostic and therapeutic techniques.

Much of the training of the amchi is based on the 'Gyushi' (four tantras), a medical text compiled in the eighth century in Tibet incorporating ancient Indian, Persian, Greek, Chinese, Nepali, Dolpa, and Tibetan traditions of healing (Rinpoche 1973). This medical system flourished across the Himalaya – including Dolpa, Humla, Mugu, Gorkha, Sindhupalchowk, Mustang, and Rasuwa districts of Nepal, where it is practiced to this day. In Lo-Manthang, Mustang, it has long been a tradition for the king to have an amchi as his 'lamenpa' (personal physician). For example, Amchis Gyatso and Tenzing's father was the personal physician to King Jigme Palbar Bista. Similarly, in Dolpa, lamas of various monasteries have combined medicine with their

religious practices and have further promoted the medical tradition. Today, Dolpa has the largest number of amchi in Nepal, followed by Mustang and Gorkha. Despite a decline in the tradition over time due to various socio-political factors, a process of revitalisation, from both within and without, has started in Nepal.

The doctor and the amchi: some noteworthy differences

Without underestimating the contributions of modern medicine to human health, or of traditional medicine to the majority of the world's population, some essential differences between a biomedical doctor and an amchi are highlighted here. In the context of lobbying for national and international recognition and support, while we emphasise that an amchi is also a doctor, we still maintain some essential differences between the two. Although the emphasis on differences is in itself superficial, it is useful to raise questions on a broader perspective as to how the two systems of medicine might learn from and enrich each other, so as to better serve the health care needs of local communities in the rapidly-changing socioeconomic and political environment of Nepal.

Theory and practice

The amchi tradition is based on Buddhist and Bonpo philosophies, which recognise that the three mental 'poisons' of desire, aggression, and delusion give rise to three psycho-physiological energies, the imbalance of which causes disease. It is the association with philosophy and religion that renders this system of medicine 'esoteric' and 'metaphysical', and thereby suspect to followers of biomedicine (Dummer 1994), which is based on natural science (Aschoff and Rosing 1997). Biomedical doctors have mostly viewed traditional medical practitioners with suspicion, although since 1978, the World Health Organization (WHO) has recognised the importance of integrating the two systems of healing (Helman 1990). Table 1 highlights these important differences.

Table 1: Aschoff and Rosing (1997) outline the following differences between biomedicine and amchi medicine

	Biomedicine	Amchi Medicine
Basis	Natural science and empirical research	Theory of science based on the school of thought of five elements, three energy systems, and Buddhist philosophy
Pathogenesis	Impaired functions and structures of different organs	Behaviour, lifestyle, nutrition; differentiation between complaints and diseases generated by ignorance, adherence, and hatred
Diagnostics	Past medical history, physical examination, chemical analyses, technical tests with the support of chemistry and physics	Subtle observation and perception; past medical history; diagnostic palpation points of organs; pulse, tongue, and urine diagnoses
Therapy	Consultation, symptomatic treatment with medication through operation, radiation, chemotherapy, physiotherapy and technical interventions, and psychotherapy	Preventive approach through advice on lifestyle and nutrition to restore imbalanced health; massage, balneotherapy, medication, and moxibustion
Pharmacology	Analyses and syntheses of chemical substances; in vitro and in vivo trials; natural scientific efficacy checks	Testing the tastes of plants and plant parts; testing animal and mineral substances; defining the cooling or warming effects of plants
Research	Random sampling and statistical evaluation; retrospective and prospective studies	Individual medicine; only empirical research; does not conform with western medicine

Transmission of knowledge and training

Biomedical doctors are trained in formal medical schools that follow strict admission policies, rigorous criteria for selection, and definite course periods of study. In theory, any able candidate – male or female, rich or poor – can become a doctor; in reality, race, class, culture, and gender may preclude equal opportunity. In Nepal, amchi are trained informally; knowledge is generally transmitted from father to son or from teacher to disciple. Training usually starts at a young age, when the student learns medical theory and identification of 'materia medica', including uses, parts used, properties, availabilities, and preparation techniques. Therefore, in the amchi hereditary tradition, training can span from childhood to adulthood. In recent years, the Dhorpatan Amchi School and the Lo Kunfen Mentseekhang and School have been established to provide formal training to young amchi, including female students.

Production of new knowledge

Biomedicine has progressed due to the immense focus on research and development in the constant quest to develop new drugs for old and new diseases. The amchi medical system, on the other hand, takes pride in the fact that it is a thousand-year-old tradition that has withstood the test of time. However, more amchi are now innovatively developing new formulas or testing old ones for efficacy. Some amchi are also researching new medicines, although this effort is mainly restricted to the medical institutes in Lhasa and Dharamsala.

Recognition and legitimacy

Biomedical doctors are regarded with high esteem in Nepal and around the world. The amchi is recognised only in his village or district, by virtue of the services that he provides and their curative effect on patients. Aside from training on plant identification and use by the Ministry of Local Development, the tradition is not officially recognised by the Ministry of Health. Similarly, traditional healers, such as 'dhami' and 'jhankri', are only used by the government health sector to promote state-sponsored health programmes, such as tuberculosis control or vaccination. In contrast, the Ayurvedic medical tradition is recognised alongside the biomedical system through the establishment of separate colleges, hospitals, and government agencies.

Economics

While the cost involved in the training of a biomedical doctor is high, an amchi in Dolpa or Mustang is not traditionally required to pay any training fee. Although the financial investment in acquiring biomedical training is relatively high, a medical student can expect to retrieve the cost of the training after starting to practice. In the case of the amchi, not only does he not receive a consultation fee, but he also must use his own limited means to provide medicine for his patients. The practice of serving all patients regardless of their social status and ability to pay is influenced by the Buddhist and Bonpo philosophy of benefiting all human beings.

Nature of patients

Based upon past beliefs and history, preferences of patients vary in terms of medical treatment, even in the presence of options. In Kathmandu, for example, patients who consult an amchi are increasingly resorting to the use of diagnostic technology (such as ultra-sonograms, x-rays, and CT-scans) prior to taking the amchi medicine prescribed. In general, it seems that patients seek biomedicine for emergencies; such

as ruptured appendixes, fractures, and heart attacks; and consult 'non-orthodox practitioners', such as an amchi, for chronic ailments that biomedicine "currently finds difficult to cure" (Sharma 1992).

Institutional framework

Across the world, the profession of the biomedical doctor is embedded in the institutional framework of the state-sponsored health care system. Biomedical doctors form an international network based on their common objectives, learning, and experience. They are backed both by their governments and by industry, as can be seen from the interdependence between doctors and pharmaceutical companies. Most amchi in Nepal are located in remote villages of the Himalaya and lack access to a larger official network that enjoys the support of government and industry. These amchi are striving towards achieving recognition and support from the government through the development of a professional association.

Challenges faced by the amchi in Nepal

People living in mountainous areas of Nepal eke out livelihoods in the harsh environment by engaging in subsistence farming, animal husbandry, and seasonal trade. In addition to meeting livelihood needs, a key challenge faced by the amchi in the practice of medicine is the lack of recognition and support of their profession by the government. Another major challenge is financial difficulties in purchasing medical ingredients, since amchi are not financially compensated for their services. Due to livelihood constraints, amchi are often unable to complete the necessary training, and thus a gap arises between medical theory and practice, affecting the efficacy of treatment.

The growing trade in medicinal plants of the Nepal Himalaya puts pressure on several species and decreases the availability for medicine of key species, such as 'honglen' (*Neopicrorhiza scrophulariiflora*). There is also a problem of insufficient training, resulting in incorrect diagnoses and poor medicine quality. With limited means to purchase medical texts for the training of new amchi, there is increasing concern about the formal transmission of knowledge to younger generations amidst alternative means of livelihoods. Many amchi in Nepal have no access to formal training, even with the recent establishment of schools in the remote districts of Baglung and Mustang.

Initiatives by and for Himalayan amchi

Although the planning for an association started in the early 1990s, due to policy complications and other factors, it was only in 1998 that the Himalayan Amchi Association (HAA) was officially registered as a non-government organisation (NGO) in Nepal. Based in Kathmandu, the HAA enables the exchange of knowledge and experience among amchi from across Nepal and provides a forum for lobbying for recognition and support by the government. The HAA is developing a strategy for promoting the amchi tradition; focal points are providing formal training on topics related to medical theory, diagnosis, and treatment; improving the quality of medicine produced by amchi; and exchanging information among Sowaigpa practitioners throughout the Himalayas. The First National Conference of Amchi was held in January, 2001, with financial support from the Japan Foundation's Asia Center and WWF-Nepal People and Plants programme; 85 participants attended. Of these, 25 amchi were

selected for in-depth training on the Chimagyu text. The amchi were also provided with medical texts and medicinal plants from the lowlands. The Second National Conference of Amchi was held in January 2002 with financial support from the Japan Foundation's Asia Center, WWF-Nepal People and Plants programme, and Drokpa. A second group of 32 amchi received in-depth training on the Chimagyu. The Third National Conference of Amchi was conducted in December 2002.

The Lo Kunfen Mentseekhang and School in Lo-Manthang, Mustang, was started in 1999 to provide formal education to young amchi. This initiative is important in that it provides an opportunity for girls to pursue medical study; 21 students from Mustang and Dolpa are currently enrolled. A museum and herbarium are also being developed for the training of the students. Furthermore, research is being conducted on the availability of medicinal plants in the area, identification of plants for cultivation, and a search for new medicines through experimentation with the tastes and properties of medicinal plants. A new medical production unit was started in 2001 and ensures the consistently high quality of the medicine produced.

The Gangchen Menkhang is a traditional health care centre established in 2000 in Shey Phoksundo National Park, Dolpa, by the amchi of the village development committee of Phoksundo, with the support of the World Wide Fund for Nature (WWF) and the People and Plants Initiative (PPI). An NGO has also been registered at the district level to manage the health centre, which provides health care services to the communities inside the park and monitors the use of medicinal plants in the area. The health centre works closely with the Taprizha School and provides health care services to the students, as well as training them in plant identification and use. As part of the applied ethnobotany project, WWF and the PPI project have focused on promoting the amchi tradition by organising amchi trainings, supporting exchange of knowledge among amchi through study tours and workshops, providing medical texts, and organising primary health care trainings.

Similarly, the Dolpa Ribo Lama Amchi Association is a district-level NGO established in Dolpa following the first Amchi workshop in Dolpa in June 1998, which was attended by over 50 amchi (Figure 1). This NGO has built a traditional health care centre with financial support from WWF.

Tengboche Monastery and the Sacred Land Eco-Centre in Solukhumbu are involved in promoting the amchi tradition through operating a traditional health care centre in Namche, documenting medicinal plant resources in Solukhumbu, and managing a medicinal plant nursery near Tengboche.

The Remote Area Development Committee of the Ministry of Local Development, in collaboration with the technical expertise of the Department of Ayurveda of the Ministry of Health, has been training amchi in identification and sustainable use of medicinal plants. For the past ten years, groups of amchi from various districts have been assembling in Kathmandu each winter and receiving training from more experienced amchi and Ayurvedic practitioners.

NOMAD is an NGO working with the amchi of Ladakh, India. It is involved in training amchi in issues related to intellectual property, access, and benefit sharing (Figure 2).



Figure 1: Participants of the First Dolpo Amchi Workshop in Dho Tarap, Dolpa, June 1998



**End of free access to raw materials for local amchis and
undeserved profits for foreign companies.**

ཕྱི་ཁག་ཁ་ཅིག་གིས་རིན་ཐང་ཆེ་བའི་ཕྱོད་སྒྲུབ་གྱི་འཕྲོད་ཁུངས་ཀྱི་
ཞོར་འབྲུལ་གྱི་ལམ་ནས་བཅད་ཕྱིད་ཕྱིད་སྤྱོད།

Supported by NCHAD 800, France
Research & Action for Endowed Health Systems

Figure 2: NOMAD Poster highlighting problems faced by amchis

The Mentseekhang in Dharamsala, India, provides formal training courses for amchi. It is also involved in the development of amchi medicine. Interesting for the amchi in Nepal is the production and marketing of several new products, such as incense, herbal tea, cream, and massage oils. It also operates a network of clinics throughout India that provide traditional medical treatment.

In the eastern Himalayas, the National Institute of Traditional Medicine (NITM) is supported by the Royal Government of Bhutan to provide traditional medical services. The Bhutan Ministry of Health supports both traditional medicine and biomedicine, enabling patients to make their own choices regarding treatment, even in the remotest districts.

The Government of China also promotes an integrated system of health care. The Tibet College of Medicine in Lhasa, for example, provides formal training to amchi who go on to serve in government clinics after graduation. The Mentseekhang provides traditional medicine training.

Organisations such as WWF, Japan Foundation, Drokpa (an NGO based in the USA), NOMAD, American Himalayan Foundation (AHF), International Centre for Integrated Mountain Development (ICIMOD), and Earth Island, to name a few, are also actively promoting cultural traditions of the Himalayas that are relevant to the people themselves and that are conducive to sustainable development. The general motivation of these organisations is to focus on groups who have been marginalised by development interventions and on areas that are ecologically significant.

Envisioning the future

Government recognition and support

Amchi are actively lobbying for recognition and support by the Ministry of Health in Nepal. 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. The amchi also look to the government for recognition for other reasons. They want to be authorised to provide health care services in their respective communities, since government health posts and sub-health posts have not been effective in delivering health care in the remotest districts of Nepal. Also, as a legitimate group of medical professionals, amchi would face fewer problems when accessing medicinal ingredients, such as medicinal plants. Finally, amchi see government support and recognition as important for research and development of their tradition.

Ecological and financial sustainability

Across the border in China, the amchi tradition has achieved remarkable progress in terms of opportunities for training and practice. Simultaneously, there has been a tremendous growth of traditional medical factories, which have affected the quality of the medicine and the ecological sustainability of the enterprises. The Government of China is currently enforcing quality control of traditional medicine, which will affect many factories. The amchi of Nepal have a unique opportunity to learn from this experience. The production and sale of medicine is a potential source of income for amchi and could mitigate the financial problems associated with their practices. At the same time, it is important for amchi to be wary when the production of medicine is driven solely by profit motive. In this case, not only is the quality of medicines likely to be compromised, but also the relationship between the amchi and the patient, as outlined in the Gyushi, may be lost.

Safety and efficacy

In order to be recognised by the government, amchi medicine will have to meet the requirements for safety and efficacy. While biomedical drugs are required to follow a series of quality control measures, this is not applicable to the medicine produced by amchi. In general, amchi in Dolpa and Mustang prepare medicine in small amounts so that potency is not affected. However, with increased production of medicine by amchi practising in clinics in Kathmandu, the quality of the medicine may be affected if certain measures are not followed.

Some amchi do not use the correct amounts of medical ingredients, thereby affecting the efficacy of the medicine. It is extremely important that amchi are trained to follow specific guidelines in preparing medicines. This includes following necessary post-harvesting techniques, such as cleaning, drying, and storing of medicinal plants. It is also crucial to prescribe medicine in the correct dosage to maximise efficacy and minimise side effects. Also, amchi must ensure that the medicine they provide to patients is labelled correctly, and if patients cannot read, that dosage and timing are explained accurately.

There is a growing awareness of the use of toxic materials, such as mercury, in certain medical formulas, and this causes negative publicity for amchi medicine. Although amchi follow a process of detoxification when using substances like aconites (*Aconitum* spp.), it is important to be aware of ongoing international research on amchi medicine.

Substitutes for rare and endangered species

In cases of rare and endangered species – including species which are becoming rare due to increasing trade – the use of substitutes offers an important option for amchi to consider. Many substitutes are already in use in Dolpa and Mustang. At the Second National Conference of Amchi held in Kathmandu in January, 2002, potential substitutes were identified for species that are becoming rare or are otherwise problematic from a conservation perspective. Amchi must come to a consensus about substitutes that can be safely and efficiently used through sharing of knowledge and expertise.

Sustainable use of medicinal plants

Although traditional knowledge is not a panacea for modern environmental problems (Ellen et. al. 2000), there is still much for modern science to learn from amchi knowledge. The empirical knowledge that amchi have about the ecology, distribution, biology, and harvesting of medicinal plants is a valuable base upon which to develop guidelines for sustainable use. For example, based on knowledge of amchi of the morphology and regeneration patterns of 'pangpoe' (*Nardostachys grandiflora*) and 'honglen' (*Picrorhiza scrophulariiflora*), botanists and resource managers are developing guidelines for sustainable use of these high-altitude medicinal plants in Dolpa.

Cultivation of rare and threatened species of medicinal plants

Due to the increasing global trade in medicinal plants and the commercialisation of traditional medicine, there is growing concern about the availability of medicinal plants for local health care needs. Although amchi 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 naturally

rare, that have become rare, or that are not available in their districts. In Dolpa, for example, amchi are cultivating 'ruta' (*Saussurea lappa*), a species that was traditionally brought from the neighbouring district of Mustang.

Training, research, and development

Younger-generation amchi must be aware of the wider issues that confront their communities. It is no longer enough for amchi to focus only on providing health care; today, they are confronted with the problems of decreasing medicinal resources, and also must grapple with the wider issue of biodiversity conservation. To develop this tradition in the modern context, substitutes for certain problematic ingredients (rare and endangered species) must be explored. Technological advancements and improved transportation and communication bring new problems related to appropriation of knowledge and resources, even in the remotest villages. In Ladakh, amchi are learning about issues related to the appropriation of traditional knowledge and resources by external agencies, such as pharmaceutical companies.

While adhering to their medical tradition, it is important for amchi to understand and learn from certain aspects of biomedicine. In the same vein, amchi can also provide an opportunity for biomedical practitioners to improve their knowledge and practices. Some amchi are interested in incorporating certain aspects of biomedicine, such as vaccinations, while others are more interested in maintaining a pure tradition. These are issues that amchi must collectively discuss in order to further their tradition.

Conclusions

This paper has attempted to highlight the role of amchi and the constraints they face in their ancient profession of delivering health care to communities in remote mountainous districts of Nepal that would otherwise have little or no access to formal health care services. Their vast knowledge of the pastoral environment, the resources therein, and the health problems that they encounter and treat situate the amchi of the Nepal Himalaya in a unique but challenging position to further mountain development and conservation. While a trend towards 'formalisation' of this system of medicine is increasingly visible across the Himalaya, especially in Nepal in the effort to achieve 'legitimation', there is the danger of losing the localised knowledge and practices that amchi have developed, adapted, and perfected over time. In this regard as well, the amchi must proceed very carefully to promote this tradition of healing.

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



Cover Photo: A Mongolian horseman (*from the presentation by Ayurzana Enkh-Amgalan*)

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

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Background

The secret to why nomadic pastoralism existed and fed Mongolians for centuries was its capacity to keep ecological balances. How? 'Traditional grazing technologies' – four seasonal pastures with sufficient reserves for emergencies, and grazing with due consideration of growth phases of vegetation and recovery after previous grazing – were the first secret. The moderate demand resulting from the subsistence nature of Mongolians' lifestyle was the second secret.

The extensive livestock industry of Mongolia provides almost half of national employment and contributes 34% of gross domestic product and 31% of export earnings, including animal fibre. Yet, it still remains largely a subsistence economic activity. The major characteristics of this extensive livestock industry in the context of the current study 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. The most extreme natural hazard is 'dzud', a winter disaster involving the mass starvation and death of livestock. The second most important danger is drought, which usually happens due to the failure of principal rains in June-August.

The beginning of the transition of the Mongolian economy to a market-oriented system in 1990-1991 caused the collapse of the extensive livestock production system developed over the previous 30 years. The government privatised the ownership of stock, and in reaction to long years of central planning, stepped back, leaving the industry to reorganise itself. During the ten years of transition since, the dominant policy has been to pursue livestock privatisation and price liberalisation, expecting the market to do the rest. The following have been the results.

- Opening Mongolia to globalisation had a drastic effect in increasing human demand, and herders were not an exception.
- Livestock privatisation provided tremendous incentives for increasing livestock numbers.
- The state cancelled its subsidies in most livestock-related areas, and herders responded by increasing livestock numbers to overcome increased risk.
- The break of centralised livestock procurement, and the absence of an adequate replacement, significantly restricted the marketing of animals.
- Increasing livestock numbers as 'savings' against future uncertainties became a dominant risk management strategy.
- Low to moderate growth in other industries made herders save more animals for their children.

- The state continued its policy of awarding herders who had 1,000 animals.
- The destruction of thousands of wells because of inadequate ownership and maintenance curtailed utilisable pastures.
- Mass migration of herding families from remote to central regions worsened ecological imbalances.
- Livestock privatisation resulted in fragmentation of the industry; 84% of herding families own less than 200 head of livestock, leading to fierce competition among them to increase livestock numbers and possess more pasture resources.

These changes were hastened by private interests of new, small household economies and free competition, yet the land tenure system remained unchanged: state ownership and largely free access to 'common property' resources. As a result, private interests of individual herders in maximising livestock numbers contradicted the national interest in ensuring long-term sustainable development of the industry by maintaining the potential of pasture resources. Increasing overstocking and improper grazing practices began to destroy the ecological balance, a keystone for nomadic pastoralism. Analysis covering 20 years of time-series data from 36 meteorological stations (where other non-meteorological data were also collected) shows that a 1% increase in stocking rate (the number of sheep units per hectare) leads to a decline in the natural growth rate of animals (birth rate minus mortality rate) by 0.58% for cattle and 0.007% for sheep and goats, suggesting that a shortage of pasture is more serious in the cattle industry. A larger proportion of cattle are located near urban areas, where pasture is the most degraded.

It is becoming increasingly clear that existing small households badly lack resources for such important services as preparation of supplementary fodder, medication for livestock, transportation and marketing, and overcoming production and price risks. Utilisation of supplementary fodder and veterinary services is decreasing, and herders are apparently unwilling to use superior stock for breeding purposes, indicating the danger of a long-term decline in animal productivity and quality of outputs.

The gap between rich and poor herders is increasing dramatically. Many poor herders have just recently begun herding. Because of the transportation and labour constraints on conducting seasonal moves and marketing products, poor herders are mostly restricted to low-quality pastures near district ('sum') centres, and are thus exposed to increased poverty. Furthermore, relative to established richer herders, poor herders have limited capabilities to acquire the good winter and spring camps crucial to surviving cold seasons.

The above problems illustrate that, although transitional reforms centred on privatisation and price liberalisation have laid out a framework in line with overall movement towards a market economy, they are far from complete. In addition to these difficulties, Mongolia has been faced with three consecutive years of dzud. About 2.4 million head of livestock died as a result of dzud in 1999-2000, another 2.2 million in 2000-2001, and 1.5 million since then. This has left thousands of herding families with no animals and has added significantly to the ranks of the rural poor and destitute. There has been a surge of aid to dzud-affected areas, including provision of fodder (mainly hay) to save remaining animals and restocking of herders who are left with no livelihood. Unfortunately, all this happens after dzud has occurred. The true question is how to make the industry capable of withstanding the affects of dzud.

This is ultimately a question of putting the industry on a sustainable path of development through solving accumulated problems.

The current project

In April 2000, the Centre for Policy Research (CPR) hosted the UNDP-SURF (Sub-Regional Resource Facilities) International Seminar, 'Recovery with Incomplete Reforms', which was attended, among others, by top officials of UNDP missions in Asian countries. A proposal was presented by the CPR to launch a small pilot project to register informal grazing rights of customary herding communities. UNDP was supportive of the project proposal and started discussions with CPR on launching the project. An 18-month pilot project, costing approximately US \$135,000 and co-financed by UNDP and the New Zealand Government under the UNDP umbrella project MAP-21, started in August 2000 and ended in February 2002.

The objective of the project was to develop and pilot a model or framework of activities that would gradually lead the extensive livestock industry of Mongolia onto a sustainable path. The project hoped to accomplish this by changing the existing behaviour of herders attempting to maximise livestock numbers – a rational choice under the existing incentive structure. The project attempted to assist herders in adopting more sustainable strategies of income generation: namely, building capacities to mitigate risks, improving productivity, and introducing alternative businesses. Enhancing collective actions among herders through strengthening of traditional customary arrangements was seen as key to achieving the project's objective.

The project team worked closely with 'aimag' (province) and 'sum' (district) governments. In each sum, a working group involving key experts was organised to support project implementation and to link the project with non-project communities in both the sum and the aimag. In addition, the project managed to establish strong collaboration with central government agencies, especially the Ministry of Food and Agriculture and the Parliament Standing Committee for Environment and Rural Development. This collaboration with top policy-making agencies was very beneficial in terms of communicating project findings quickly to policy-makers and getting broad support for the project. Also, working with these agencies helped the project deliver development approaches and findings to other donor agencies.

As mentioned earlier, building communities' capacities to mitigate risks, improve productivity, and start alternative businesses was seen as a way to build long-term sustainability of the industry. Therefore, project institution-building activities were used to facilitate implementation of other activities. To ensure sustainability and continuity of activities started by the project, mechanism building and community efforts were maximised.

The seven main project components

The project adopted a holistic approach and maximised participation of direct beneficiaries in design and implementation of activities. The participatory or bottom-up approach was necessary given the failure of the government's top-down approach to designing development programmes, as well as to delivering disaster relief assistance to areas affected by dzud. The holistic approach was necessary because

problems faced by herders in different areas were closely interrelated, and no single problem could be fully solved without addressing problems in other areas. 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. Marketing could only be improved partially if weaknesses in the existing production organisation were not overcome. And, combating pasture degradation near urban settlements required addressing the social problems that had caused rural-to-urban migration. As a result, the initial project focus – grazing land management – was broadened to include the following seven areas.

- 1) Institution building and strengthening of customary herding communities
- 2) Grazing land and water management
- 3) Supplementary feeding
- 4) Veterinary services
- 5) Livestock breeding
- 6) Marketing and SME (small and medium-sized enterprises) development
- 7) Herder business skills

Each of these seven aspects of the project is discussed in detail below, together with lessons learned.

1) Institution-building and strengthening of customary herding communities

Upgradation of informal herder institutions into formal institutions was seen by many herders as one of the necessary first steps in strengthening herding communities. These herders referred to problems caused by the existing legal status of herding families. In contrast to formal economic entities, herders are not 'legal bodies', meaning they are not registered and do not have a bank account; that seriously restrains them in terms of developing the capacity to advocate their own interests and have equal powers in relationships with other bodies. One of the main problems is that financial institutions are commonly reluctant to provide loans to herders because of their institutional uncertainty and the high transaction costs of dealing with individual herding households scattered over an enormous territory. Upgradation to formal institutions would make it much easier for herders to receive loans. Further, resolving the institutional problem and integrating several herding families into one institution facilitates many important services such as veterinary care, breeding, social services, and banking. The following are some of the clearest reasons for which cooperation is important.

- The small size of most herding households places a major constraint on efficient running of their business, influencing all aspects of herding.
- There exists a great potential to improve the performance of the industry by realising economies of scale through enhanced cooperation among herding households. Economies of scale can be realised in the following two ways:
 - delivering maximum services in an organised way,
 - cooperation to undertake alternative income generation activities not possible under the existing separation of herding families.
- Cooperation is a potentially easy solution to a longstanding institutional problem of herders – non-legal body status. Upgradation of existing customary groups of herders to some type of formal institution can change this status.

The major shortcomings of current government and donor activities in promoting cooperation are the following.

- The organisations typically supported by governments and donors are not based on existing forms of cooperation among herders.
- They generally indicate or impose one particular form of institution or cooperative.

Project experience shows that existing customary groups or communities of herders provide a good basis for promoting cooperation among herders. It is significant that these groups of herders are not equivalent to villages or city communities, where bonds between members and strength and frequency of collaborative activities are usually very high. In a community of nomadic and semi-nomadic herders, memberships and boundaries are generally loose, although they vary among communities, and cooperation is mostly associated with seasonal production and livestock marketing activities.

There exist at least two types of herding communities. First, some communities are formed around area-based key resources that play major roles, including seasonal camping areas, water points, and marshlands. In forest-steppe areas, these groups are generally people from one valley or river; in steppe and Gobi regions, they are people from one water source. This type of community has usually developed customary arrangements for regulating grassland use to some extent, which provides a good basis for upgrading into some form of grassland management unit. Second, some communities are based on non-area factors; usually, some important business activity is common to all members. The primary activity on which a community is based varies and can be marketing, crop farming, haymaking, or processing. Because member-herders might not have the same camping area, this type of community may not be easily upgraded into a grassland management unit. However, it does provide a good basis for strengthening herders' community-based organisations and providing support or indirect inputs for grassland management.

With support from the project team, herding communities formally established six NGOs and one cooperative. The project became very popular among herding communities and local aimag and sum governments. Increasing numbers of herding communities expressed interest in joining the project. According to a survey conducted in June-July 2001 among herding families in project sums, 80% supported community-based cooperation, and 55% expressed interest in formally establishing community-based institutions.

Lessons Learned

- Despite their willingness, herders seriously lacked the leadership, knowledge, and skills to engage in deep collaborative activities. The project spirit provided leverage for leadership and advice on how to collaborate, and thus inspired herders towards deeper cooperation.
- Strengthening herding communities empowered people to take the initiative for development, thus contributing to the distribution of development resources more evenly in favour of the rural and the poor.
- The NGO form of institution was preferred by herders due to its simplicity, its few requirements for establishment, and its low transaction cost.
- Transparency and accountability of activities among communities, especially those associated with funding, are crucial for further strengthening newly-established herders' institutions.

- Newly-established herders' organisations lacked management skills to run businesses on a collaborative basis, so strong capacity-building activities were needed.
- Voluntarism is and should be a key principle in promoting cooperation among herders. Demonstration should be the only method allowed for attracting herders and convincing them to join community-based organisations and activities. One must expect outsiders to coexist with community-based organisations; making sure that these individuals are not discriminated against in any way, including grazing rights, is crucial.

2) Grazing land and water management

Recognition and protection of herding communities' rights to possess and use pastoral resources – such as seasonal pastures, water points, and marshlands – were proposed as tools to build disincentives for increasing animal numbers. Recognition of grazing rights also provides an effective tool for resolving grazing conflicts.

Introduction of long-term possession contracts aims at making protection and efficient use of pasture resources a matter of self-interest for herders. It also provides increased incentives to invest in improvement of pasture resources, thus promoting adoption of more advanced methods of production. Further, it impacts poverty alleviation. Poorer herders tend to occupy poor-quality pastures, and as pressure on pastures increases, poorer herders are pushed to increasingly less productive pastures. In this situation, protecting the grazing rights of poor herders, who are heavily dependent on livestock herding, is crucial.

To maintain the flexibility of herding households in accessing pastoral resources, land possession contracts are based on strengthening or formalising the best customary arrangements for regulating grazing land use, rather than neglecting or destroying these prior arrangements. These contracts are based on the following principles:

- existing allocation of pastoral resources among communities and families;
- normal or equilibrium pattern of herder migration, including specific provisions for reciprocal grazing rights in cases of emergency;
- 'point possession' of family camping points – boundaries around camping points and resolution of conflicts should be ruled by customary arrangements; and
- a combination of formal powers (aimag, sum, and 'bag' governments, the latter referring to the smallest administrative unit in Mongolia) and informal arrangements to resolve grazing conflicts between families and communities, with informal arrangements always preceding intervention by formal powers.

Grazing management is inseparable from water management. The project piloted a scheme that can be used for digging new wells or rehabilitating old ones. The scheme focused on the following activities:

- identifying communities' needs for watering points, determining designation (whether for drinking water, irrigation of seasonal pastures, or other uses), location, and capacity;
- building communities' commitment to invest in and maintain a well by clearly specifying responsibilities and incentives;
- legitimising community possession of a well with the sum government;
- assisting herding communities in accessing facilities or organisations to dig or rehabilitate wells, and establishing contracts with them when necessary; and

- assisting herding communities in maintaining wells (including training, developing, and implementing rules for community possession or ownership).

The pilot scheme, in the case of Ulziit community in Erdene Sum, demonstrated that herding communities are able to invest in digging or rehabilitation of wells if it fits into the specific needs of the community and if their possession or ownership is ensured. Herding community members agreed to contribute 30% of the total cost of digging a new well (the total cost was around US \$6,000), in the form of a soft loan. It was also agreed that wells with the capacity to water animals would be dug in pastures previously possessed by the community for 60 years.

Lessons Learned

- Formalisation of informal grazing rights can produce positive results. For example, as a result of introduction of the possession contract, member-households of Ardiin Eysel community, Erdene Sum, took action to protect winter-spring pastures possessed under the contract from trespassers during the summer-autumn season by allocating one family to stay in the winter-spring camping area and guard the pastures.
- Community-based grazing land management has great potential to reduce pastoral risks. For example, community-based organisation of remote grazing and fodder preparation helps poor members of the community avoid losses during disasters, which is not possible individually.
- Project land tenure activities inspired local governments. The Erdene Sum government, based on the pilot project model, decided to introduce possession contracts into the whole sum territory. The sum government is expecting much from planned project activities.

3) Supplementary feeding

Currently, most fodder preparation (purchase or production) and delivery is organised by government and aid agencies, without due consideration of fodder demand. Thus, there is a high risk of inefficient use of budget and aid money. Assisting herding communities in enhancing cooperation towards efficient preparation, storage, and consumption of supplementary fodder was thus crucial for making herding communities more resilient to the harsh winter conditions in Mongolia. The project-initiated revolving supplementary fodder fund works on the principle of self-sustainability. To launch the fund, the project used the following scheme.

- The fodder requirement of each household was identified in the field.
- The minimum cost for purchasing and transporting fodder to sums was identified.
- The project allocated funding to finance the purchase and transportation of fodder.
- Actual delivery of the service was carried out through competitive bidding procedures.
- Fodder was delivered upon signing a tripartite (CPR, herders' NGO, and individual member or household of the NGO) loan agreement, with collateral shared by member-households. The loan was repaid over a six-month period. Later loan agreements were established only between NGOs and their members.
- Revenues from repayment of loans were used to finance a revolving supplementary fodder fund under the ownership of the NGO.

The cost of establishing a reserve supplementary fodder fund was US \$460-1,223 per community or \$25-91 per family. The repayment rate of fodder loans was 100%, and the funds collected were used for preparing fodder for the next year.

Lessons learned

- Project experience shows that it is feasible to establish a revolving supplementary fodder fund under community ownership. This approach seems to have the following advantages against reserve funds established or administered by outside bodies, including the government.
 - Ownership by direct beneficiaries means greater efficiency and less possibility for intermediaries to seek rents.
 - The sustainability of reserve fund handling by government bodies is highly questionable, given the high costs of delivery and limited budget resources.
 - Community ownership decreases the dependency of herders on subsidies and other forms of grant assistance and promotes a self-reliant mentality, crucial for building long-term industry sustainability.
- Community-based arrangements for fodder preparation significantly promoted voluntary initiatives by community members. For example, Mr. Dagva, a member of Ardiin Eysel community, Erdene Sum, Tuv Aimag, started an initiative to expand horse-drawn hay-mowing to prepare hay for the community reserve supplementary fodder fund.
- In the future, if herders can manage excess resources in normal years, community fodder funds can be increased to cover risks in abnormal years. This could be another interesting pilot activity. Eventually, if a community's capacity was built up, there might be no need to differentiate strictly between funds. In this case, one common fund, augmented by internal savings, could be manipulated to address urgent community needs, including risk coverage or social problems. The project hopes that community funds may develop this way in the future. To facilitate this, the project assisted herding communities in developing and approving rules for the use of common-purpose funds.

4) Veterinary services

The livestock sector loses much productivity to unavailable and/or low quality veterinary services. Problems with veterinary service provision include the following:

- low financial, professional, and business capacities of recently-privatised veterinarians;
- high costs of veterinary medicines relative to purchasing power of herders;
- frequent shortages of medicines; and
- weak partnerships between veterinarians and herders.

The project focused on the following three activities to address these problems:

- establishment of a revolving fund for veterinary medicines, including more than 20 kinds of frequently-used medicines. This fund was similar to the supplementary fodder fund;
- establishment of contractual arrangements between herding communities and selected local veterinarians;
- building of a mobile dipping bath for small stock, a new design to accommodate current conditions.

Lessons Learned

- Willingness of herders to obtain veterinary services is increasing and can be significantly enhanced if herding families are organised to obtain the services in a collective manner.
- There is much room for improvement in delivery of veterinary services, through partnerships between veterinarians and herders and improved managerial and business skills of veterinarians.
- The revolving veterinary medicine fund can significantly contribute to the improvement of veterinary services for herders.
- There is good potential among herding communities to maintain the revolving veterinary medicines fund on a self-sustainable basis.

5) Livestock breeding

The project aimed to address livestock breeding and productivity problems by promoting herders' interest in investing in activities to improve livestock productivity. We succeeded in increasing herders' interest through on-site trainings by project experts on the benefits of quality animals, as well as through promotion of collective action by established herder communities and NGOs. Herding communities discussed pressing issues concerning animal quality and breeding and decided to purchase superior breeding animals in order to improve the quality of their animals. A general agreement was made between the communities and the project that the project would cover transportation costs of delivery of superior animals from the supply source to the communities, and the communities would pay the price of the animals. The project also assisted herding communities in certifying cashmere quality through a competent organisation.

Planned breeding activities, however, have not been implemented fully, mostly because of natural disasters in 2000-2001, which severely impacted both project sums and sums from which the project was planning to supply breeding animals. For example, in 2001, Bayanhongor Aimag faced a severe summer drought, followed by a cold, snowy winter. As a result, the quality of breeding animals in Shinejinst Sum was severely eroded, and project communities decided to postpone the planned purchase of animals.

Lessons learned

- Herders generally understand the benefits of quality livestock; however, the existing incentive structure does not provide enough incentive for herders to take action without intervention or support. For example, incurring additional costs for quality improvement is uneconomical for herders while cashmere is priced by gross weight.
- Herders need assistance in obtaining information about accessing quality breeding animals and livestock products. Assistance in funding purchase and delivery of breeding animals also provides a strong incentive for herders to invest in livestock improvement.
- Herders' knowledge of elementary breeding activities must be improved, and local access to professional breeding services must be greatly increased.
- Project experience shows that herders are generally able to pay the price for breeding animals. Assistance, when possible, might be needed only for providing information and funding delivery costs.

6) Marketing and SME development

The project attempted the following activities to improve the marketing capabilities of herding communities:

- enhancing collective actions among member households to build up collective bargaining power;
- improving access to reliable markets and information;
- providing technical assistance in gaining economies of scale in transportation, storage, and processing of livestock products;
- analysing and certifying the quality of livestock products; and
- establishing long-term partnerships with marketing partners.

These activities were carried out through three channels – short-term training in best marketing practices, provision of up-to-date information, and implementation of SME projects. These SME projects played a very important role by providing an opportunity for learning by doing. However, accessing potential lenders (bank and non-bank financial institutions) was a difficult problem for implementation of SME projects.

Lenders were unwilling to deal with herders for the following reasons.

- They had no experience in lending to herders or herders' groups.
- Herders previously had not constituted legal bodies and had created problems for financial institutions. This mentality was dominant, even though project communities had upgraded into formal institutions.
- Financial institutions were not willing to accept livestock, the only assets herders own, as collateral.

Thus, an agreement was made with UNDP that allowed CPR to provide loans to project communities. The project assisted herding communities in developing SME projects. All projects were initiated by the communities themselves and reviewed by project experts. Starting in May, 2001, CPR released six loans of a total sum of US \$8695. The average loan term was three months, and interest was 3% per month. As of February, 2002, four loans had been repaid fully, and two loans had outstanding balances with a total sum of US \$459. Cow losses during the dzud of spring 2000 caused a major problem in one of these two communities, due to reduced milk yields during the summer and lack of managerial experience. The other community was unable to start its planned felt shoemaking activity due to a lack of raw material.

Lessons learned

- Organised adequately and provided with technical advice, herding communities have the potential to develop and implement viable SME projects using spare labour and cheap raw materials, and thus generate additional income.
- Implementation of SME projects can contribute significantly to a solution of the longstanding problem of shortage of financial capital, especially cash.
- Community-based organisations can greatly increase marketing power of herders through increased bargaining power and access to better markets.
- Community-based organisations have great potential to increase both absorptive and repayment capacities of herders in relation to external financial sources.
- Community-based organisations, if supported by the necessary capacity-building activities, can successfully cooperate with financial institutions, and thus facilitate the building of efficient and viable micro-finance services for herders.

- Considering the high seasonality of herders' cash incomes, the bulk of which come twice a year during cashmere combing in May and animal slaughtering in December, herders prefer to obtain loans for periods of at least one year.
- Most herders cannot afford commercial interest rates of more than 4.5% monthly, simply because they are not able to launch viable income-generation activities and repay loans. However, when incorporated into a group or community, which naturally includes both rich and poor herders, demands for loans for productive purposes are increased. As communities, herders are better able to take out, and pay off, productive loans.
- Commercial loans to groups vary, so that a uniform approach cannot be employed with all group loans. Under our pilot project, some communities were reluctant to take out loans with interest rates higher than 3%. This may indicate that, at the beginning stages when communities are not well established, commercial loans could financially ruin communities. However, some very well established communities already have experience with complicated collaborative financial activities. This kind of community may have the courage and skills to deal with commercial loans.

7) Herder business skills

Project PRA activities lead to the discovery that livestock herding as a business has the following weaknesses.

- Very poor consideration of long-term economic and ecological consequences
- Absence of clearly-stated objectives and plans
- Lack of knowledge, especially among young herders, of conventional livestock herding technologies, contributing to poor performance of household economies
- Lack of basic skills for running a business in a market economy
- Lack of knowledge and skills to operate in emergency situations like dzud
- Limited access to international best practices in livestock raising

Thus, project activities to increase herder business skills included the following.

- Assisting herding communities in developing and implementing business plans
- Organising a seminar to launch twinning tutorship between experienced and young herders in the communities
- Organising on-site seminars on basic knowledge of modern farm economics, management, elementary cost-benefit analysis, and accounting
- Producing a handbook for herders with questions and answers on issues most frequently encountered in livestock herding, including veterinary techniques, breeding guidelines, and conventional methods of weather forecasting (future activity)

Lessons learned

- Herders, especially younger family members, are eager to obtain new knowledge
- Herders' learning performance is better when learning-by-doing methods are used, compared with academic methods like classroom teaching
- Possibilities must be sought for organisation of trainings for young herders at the national level. A community-based pilot approach by the project might provide a good model for efficiently organising such trainings.

Analysis of the project

Acknowledged strengths

The following strengths of the project are widely acknowledged.

- The project's approach, a combination of participatory and holistic approaches
- The novelty of some unique project ideas
- Successful cooperation with central and local government agencies
- Replicability/sustainability of some models and initiatives
- Strong public relations activities

The project initiated a workshop to discuss project findings among policy makers and donors. In the opening speech, the Chairman of the Parliament Standing Committee for Rural Development and Environment said that the project's participatory approach provided a model of how policy decisions can be implemented at the herder level. He also noted that the project-initiated revolving supplementary fodder and veterinary medicine funds contributed significantly to building herder capacities.

Debatable issues

The most criticised project issue involved the revolving funds the project provided to communities, for which the following criticism exists.

- 1) Sustainability of these funds has been questioned.
- 2) The size of grant funding might be too big once the funds replicate to all 180,000 herders or roughly 9,000 communities
- 3) The funds might be providing a wrong incentive to create or join communities.

Each of these criticisms is discussed individually below.

1) Sustainability of funds

Project experience shows that there is good potential for making the funds really revolving and sustainable in the long term. The following are some points that support this view.

- The project used a scheme under which each fund was partly a grant between the project and the recipient community. However, between the community and its members, it was not a grant but a loan in the case of the fodder fund and a commercial fund in the case of the veterinary medicine fund; the funds were understood thus by the herders (the final beneficiaries). This had very positive effects – 100% repayment of fodder loans and operation of the veterinary medicine fund on a commercial basis.
- All funds and equipment (dipping bath) are used in accordance with rules developed and approved by community members and, as such, these rules have mandatory power. This means that, during the life of the NGO into which all communities 'formalised', the rules shall be in power, and their enforcement shall be monitored by both internal and external bodies in accordance with the laws governing NGOs in Mongolia.

2) Size of funds

The ultimate aim of any project is to achieve welfare improvement in herders' lives. Welfare improvement is a shift from the current state of welfare to one in which somebody or something is better off, and nobody and nothing is worse off. The

following are some characteristics of the current state of welfare of the extensive livestock industry.

- Low preparedness of Mongolia at large for natural disasters, resulting in high direct material losses of animals and crops
- Low capability, both of herders and of policy-makers, to run the industry with a long-term view, resulting in significant productivity losses

These two situations are closely linked. For example, more than US \$25 million was spent on disaster assistance in the last two years. Again, money was spent without a long-term view (the assistance did not add much to the capacities of either the herders or the government to fight future disasters). Limitations for organising relief assistance with long-term views are understandable, but there is still much room for improvement in this area. Now, Mongolia is waiting to be exposed to the next dzud and to receive another large sum in assistance, unless efforts such as our project are made to build the capacities of (most importantly) the herders.

Under this project, one community benefited from roughly US \$1,000 for launching of funds for fodder and veterinary purposes. Replication of these funds to the total of roughly 9,000 communities would require US\$ nine million. The international community spent US \$25 million in dzud relief assistance in 2000-2001. The logical question is, how much of this money has been used for building the capacities of herders to better fight against dzud, and how much money does Mongolia need for each dzud? The answer is that the money spent has not covered the needs of Mongolia's herders.

3) Wrong incentive

Project experience shows that the funds did indeed provide an incentive for at least some herders to join communities. The argument can be made that there is nothing wrong with establishing these funds, if they are made really self-sustainable and if those who joined are still enjoying it. The funds constitute a big improvement in building the capacities of herders and a shift from the current state of welfare. Nonetheless, the project team acknowledges that there is room for improving both the effectiveness and the efficiency of grant funds. The project team especially agrees that strong community development activities should precede any provision of financial incentives.

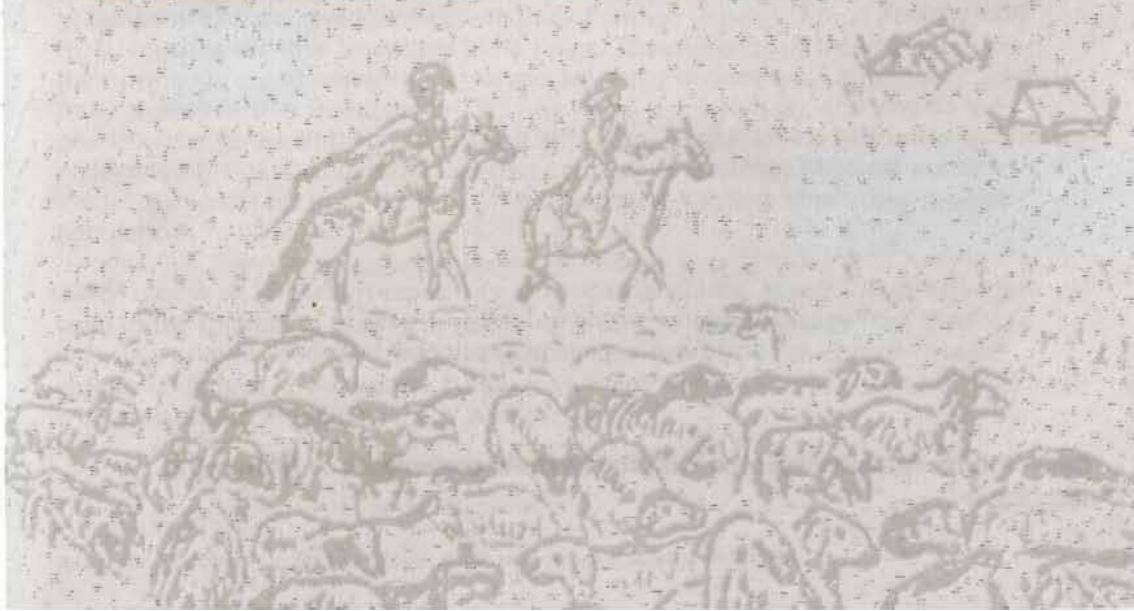
Conclusions

This 18-month pilot project ended in February 2002. Many pilot activities by the project cannot produce real outcomes in the short term. Activities in institution building and land tenure are likely to have real direct impacts only in the medium and long terms. The primary outcome of the project is that it piloted quite courageous ideas and demonstrated the feasibility of at least some of them. It can be said that, overall, the project provided a useful model for any attempt to build sustainable livelihoods for the herders who constitute 40% of Mongolia's population. There was strong support for the project by central and local government agencies and by the project's direct beneficiaries, the herders.

There are also some tangible outcomes. In May, 2001, the project conducted an analysis of the performance of project communities, compared to neighbouring herding families, in overcoming the 2000-2001 winter-spring season, including an

analysis of animal losses. Non-member families lost 6.69% of their animals, while member families lost 4.96%. Project herding families successfully reared 88.22% of young animals, higher than their neighbours by 7.85%. The better performance of project communities in saving animals and in rearing offspring can be considered the real outcome of the project thus far. It can be safely attributed to the enhanced capacities of herders for mitigating risks, through activities such as community-based revolving supplementary fodder and veterinary medicine funds and collective actions in organising remote grazing.

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



Cover Photo: Pastoral landscape in Bhutan (*from the presentation by Tshewang R. Wangchuk*)

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

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Biodiversity in Jigme Dorji National Park

Jigme Dorji National Park (JDNP) was established in 1974 as the Jigme Dorji Wildlife Sanctuary and was later upgraded to a national park in 1993. It is located in northwestern Bhutan (Figure 1) and is the largest protected area in the country, encompassing 4,349 km². It stretches from warm broadleaved forests at 1,400 masl to snow-capped Himalayan peaks towering over 7000m, and thus harbours plant and animal communities and assemblages representative of various ecosystems within a short lateral distance. The heavy monsoon precipitation and undulating topography have given rise to specialised niches, which support some unique floral and faunal species. JDNP may be the only place on earth where snow leopard (*Uncia uncia*) and Bengal tiger (*Panthera tigris*) habitats overlap. Evidence of tigers have been recorded from the eastern ridge above the small community of Barshong, at an altitude of 4060m. In that same area, snow leopard tracks were seen and recorded by field staff earlier this year [2002].

The park provides adequate habitat for several charismatic species of wildlife such as snow leopard, tiger, wild dog (*Cuon alpinus*) and Himalayan black bear (*Ursus thibetanus*). Ungulate species such as the Bhutan takin (*Budorcas taxicolor*), musk deer (*Moschus chrysogastor*), blue sheep (*Pseudois nayaur*), serow (*Capricornis sumatraensis*), goral (*Nemorhaedus goral*) and sambar (*Cervus unicorn*) support these predator populations. Phasianids such as monal (*Lophophorus impejanus*) and satyr tragopan (*Tragopan satyra*) abound in the forests. Red panda (*Ailurus fulgens*) has been recorded in temperate broadleaved forests with thick bamboo undergrowth at about 2,400 masl, much lower than elsewhere in its range. The presence of these animals, and their presence out of conventional ranges recorded elsewhere, is a matter of interest that requires further investigation. Why do tigers roam so high, and why do red pandas drop so low in their ranges in JDNP? Perhaps the answer lies in the availability of forested habitats, and in the fact that contiguous stretches of forest are still available in most parts of the park. The absence of hunting allows prey species populations to flourish.

JDNP is also an important repository of medicinal plants, about 200 of which are used in the traditional healing system. Important among them are tsiga (*Fritillaria delavayi*), several species of poppies (*Meconopsis* spp.), and the unique Chinese caterpillar-fungus called yarcha gunbu (*Cordyceps sinensis*), which is an association of a caterpillar and a fungus.

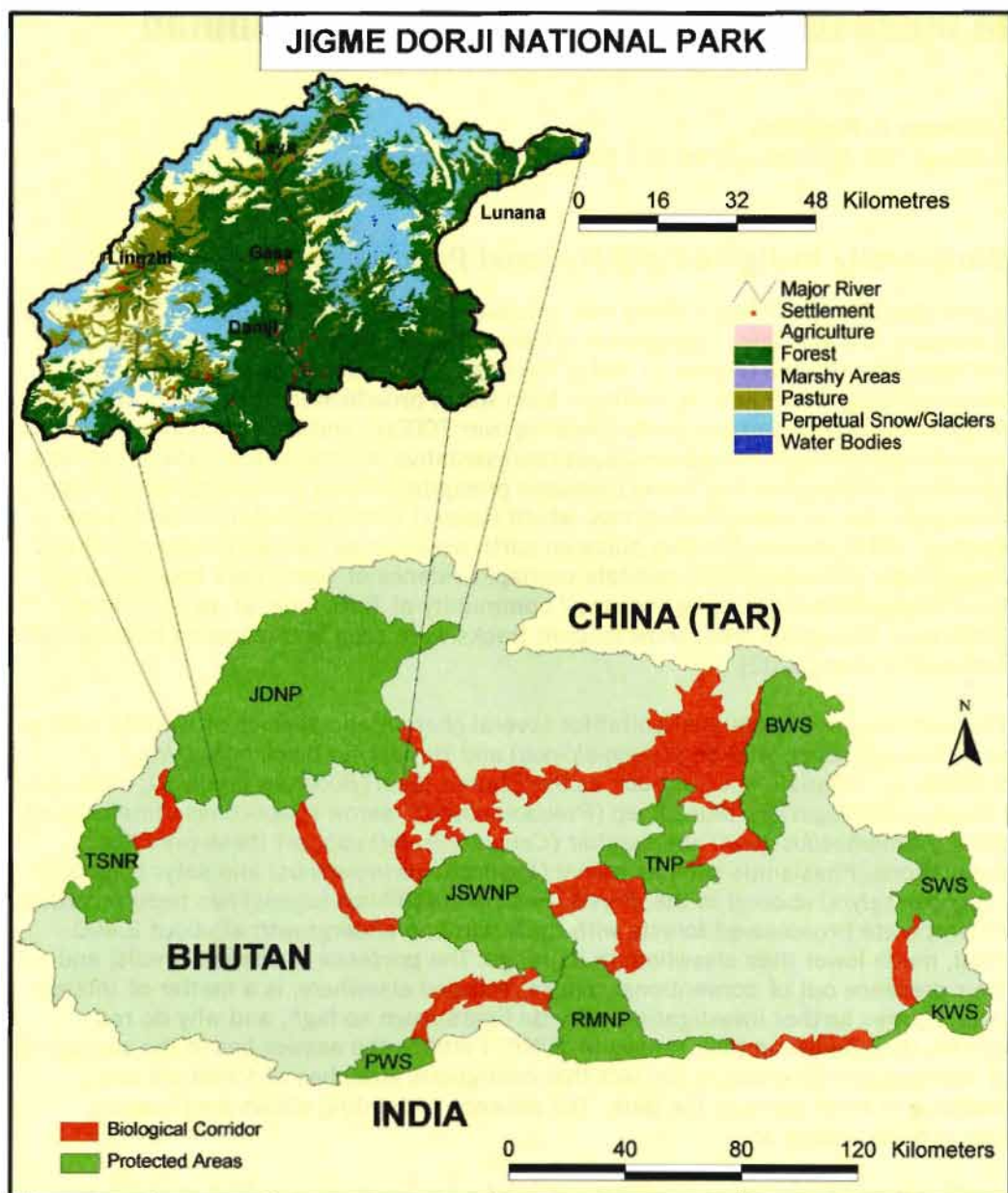


Figure 1: Location map of Jigme Dorji National Park in Bhutan

Resident peoples in JDNP

One important component of the ecosystems in JDNP, and perhaps the most influential, is the resident community. Roughly 6,500 people inhabit the park, and they rely directly on natural resources from the park. For centuries, they have co-existed harmoniously with their environment, utilising resources in a sustainable manner. However, with the onset of modern development, resource consumption patterns have changed. The schools, health centres, and other government institutions required substantial amounts of resources for their establishment. This also meant that more civil servants are now living in these areas. At present, the park covers the whole of Gasa 'dzongkhag' (district) and parts of Thimphu, Paro, and Punakha dzongkhags. Although about 90% of the residents are farmers and herders, livestock rearing is an important occupation for the communities of Soe, Naro, Bey Laga, Laya, Lingzhi and Lunana – these areas cover a significant part of the alpine meadows and scrubland above 3000m. Alpine livestock most predominantly consists of yak (*Bos grunniens*), although some cows, oxen, and equines are maintained in homesteads in the villages. Some sheep (*Ovis ovis*) can be found in the central Bhutan communities of Phobjikha and Sephu, and a government initiative has introduced this species to some other parts of Bhutan.

Yaks are alpine herders' major source of income, as well as the source of a whole array of necessary products ranging from ropes, tents, and burlap sacks to the conventional meat and dairy products. Their sure-footedness and toughness make them excellent for transporting provisions in the rough and snowy mountain terrain. Yaks are also used for draught power to plough fields. Therefore, this species, derived from its wild progenitors in Tibet, has evolved to become the most valuable domestic animal in the mountains of JDNP.

Conservation and development – do they mix?

It is clear that sustainable management of rangelands and efficient animal husbandry practices are critical for the socioeconomic development of those resident peoples who are heavily dependent on their livestock. Also, in the wake of improved animal health services and increasing human population, pressure on rangeland resources is ever on the rise.

On the other hand, conservation of biological diversity has been given high priority by the government, and development planning is not supposed to be carried out at the expense of weakening the ecological stability of ecosystems. Bhutan as a nation has been highly acclaimed globally for its conservation efforts. Its relatively low population (700,000), scattered over numerous valleys and hamlets, has enabled Bhutan to maintain a balance between resource utilisation and conservation. In recent years, the government has formulated strong conservation policies, setting aside about 26% of the country under a protected area network, further connected by biological corridors that amount to an additional nine percent of the country. The Bhutan Forest Act, 1969, was one of the first legal documents in modern Bhutan. This is testimony to the fact that the country's early leaders greatly valued the importance of forest and biodiversity conservation during the socioeconomic and political development of the country. Modern-day conservationists are grappling with the complexities of trans-boundary conservation cooperation. In the 1930s, there was an informal agreement between Sikkim, Tibet, and Bhutan regarding poaching issues

– anyone found guilty of such crimes was to be dealt with as per the laws of the land where the crime was committed (Williamson 1987).

However, conservation efforts and their successes have often been blamed for many of the ills faced by rural communities today. Rural-urban migration, modern education, and conscription into the armed forces and the body of monks have taken farm hands away from the fields. Youth, introduced to a modest schooling and exposed to towns, are reluctant to return to farms. Fragmentation of farmland has made it not worthwhile for some farmers to continue farming. To further exacerbate the problem, wildlife damage to crops and livestock, on the rise in recent years, and encroachment of farms by forests, have made it more difficult for farmers to manage their farms. What does ‘success’ in conservation mean? Is it really to blame for problems on the farms?

‘Success’ of conservation?

It has been convenient to point out the increase in wildlife populations as a success of conservation. However, is conservation really responsible for this? The Bhutan Forest Act was enacted in 1969, when many early development efforts in Bhutan were also taking place. As schools, roads, and hospitals were constructed, vast tracts of forest and agricultural lands were cleared for these developments in infrastructure. In essence, this resulted in the drastic reduction of natural habitats for many species of wildlife. As the country was still largely forested, most negative effects could be cushioned by the existing natural habitat. However, with increasing human and livestock populations and other related issues, it can be assumed that after a span of about four decades, something was bound to give way, and there would be resulting imbalances somewhere in the ecosystem.

A major cause attributed to the rise of pest animal populations is the extirpation of predators in the early 1980s by administering poison in animal carcasses. Many farmers recall poisoning carcasses to get rid of predators such as the wild dog (*Cuon alpinus*). The poison, however, did not discriminate between species and succeeded in impacting various non-target predator species such as leopard (*Panthera pardus*) and sometimes even tiger. In the absence of predators, populations of prey species such as wild pig (*Sus scrofa*), sambar, and barking deer (*Muntiacus muntjac*) increased. According to one theory, it is the amalgamation of two factors – habitat destruction and population increase – that has spilled these wild animals into the farms.

Recently, one school of thought among policy-makers in Bhutan holds strict conservation values, such as the ban on all forest fires and hunting, responsible for these wildlife-related problems. This arises from the assumption that if there were more lenient rules, forest fires and hunting would keep problem animals at bay. Therefore, it is thus elaborated that the ‘success’ of conservation (referring only to stricter laws and their enforcement) has been responsible for wildlife-related problems on farms. Although this may be partly true, due to the fact that vigilance against illegal activities is greater now with increased staff and coverage, the results of many surveys have shown that farmers either did not have the means, or in some cases the will, to kill problem animals. Officially, farmers are now allowed to kill non-endangered wildlife pests on their fields, but actual implementation of this provision is rare. Farmers and agriculturists claim that if animals are first wounded in the fields and then run into the nearby forests to die, they would be accused of performing an illegal

act of killing animals in areas outside their farms. On the other hand, conservationists find this clause, "...animals may be killed on the fields or within 200 metres from agricultural fields" necessary to prevent possible poaching of animals in the forests (DoFS 2000). It is quite surprising that a compromise cannot be found on this issue. One would think that if a kill is verified by other villagers and/or reported to the nearest official, there should be enough trust in the institutional mechanism to solve this problem.

The ban on hunting of all animals, started in 1969, may have resulted in the rise in livestock depredation by wildlife, especially in the alpine areas by predators such as snow leopard. Nonetheless, to a large extent, we must also accredit the increased incidence of livestock depredation to the increased presence of field staff, and thus the increased reporting of incidents. In some cases, anticipation of financial compensation has also spurred increased complaints about depredation.

Based on these arguments, conservation, or its success, cannot be solely blamed for what seems to be the result of a complicated web of factors. However, none of these arguments can be backed by empirical information, as baseline research on these issues has not been conducted. Presently, most of the information available consists of crop loss data and qualitative socioeconomic information, and most conclusions must be made from well-analysed personal observations and experiences of field staff and local residents.

Human-wildlife conflicts

Regardless of how much we like to adhere to terms such as 'sustainable' and 'harmonious co-existence', when humans and wildlife co-exist in the modern context, some conflicts are bound to arise. It is the degree of complexity that differentiates a sustainable management regime from an unsustainable one.

In the lowland areas of JDNF, cattle are lost to leopard, tiger, and wild dog. In the mountains, it is mostly snow leopard and Tibetan wolf (*Canis lupus*) that attack yaks. Himalayan black bear has also been known to take calves in some cases. Since the loss of one head of cattle is a significant loss to the herder (one yak costs about Ngultrums 15,000, equivalent to US\$ 350), any case of livestock depredation is important. In 2000 alone, the park office received 200 claims of livestock lost to wildlife. Although these claims were not fully authenticated, there is reason to believe that many were genuine. At the moment, no retributive killing of endangered predator species has been reported, but if depredation incidents keep increasing, and there is no action from concerned authorities, the threshold of patience may soon be crossed. That is when residents resort to retributive killing of wildlife (see Figure 2).

Bhutan is fortunate not to have entered the retributive phase for protected area residents. However, negative factors, such as increased depredation and inaction by concerned authorities, may catalyse a shift from patience over the threshold and into retribution. On the other hand, positive factors such as timely intervention, direct or indirect compensation, and reduction of depredation incidents will maintain livestock owners' sentiments within the threshold of patience.

Grazing of alpine meadows by yaks has resulted in compaction of the soil. Animal trails traverse the alpine slopes and make them more susceptible to erosion.

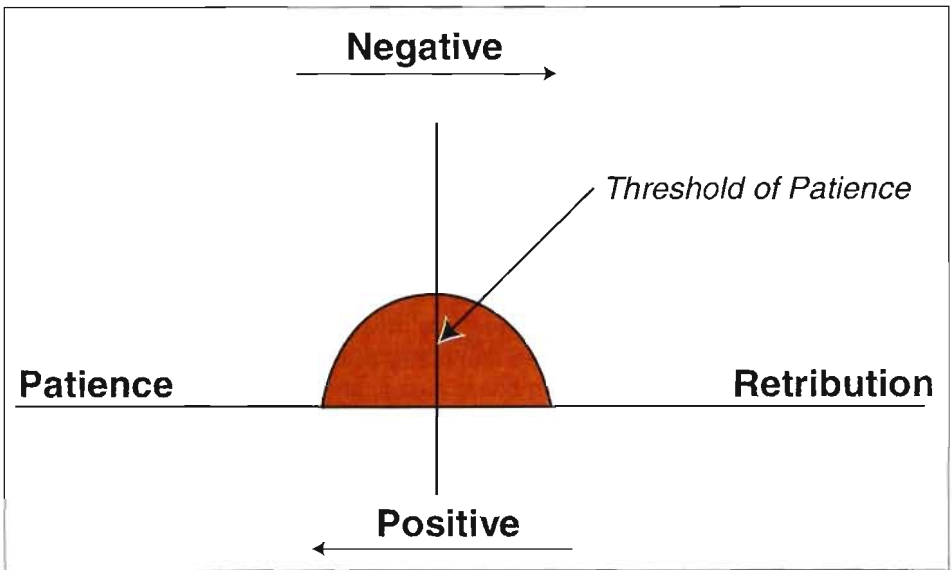


Figure 2: The threshold of patience

Wallowing in the broken soil by yaks has also rendered many areas on the mountain slopes more prone to erosion by wind and rain. Although active competition for forage between blue sheep and yak in summer has not been observed (Wangchuk 1994), there is potentially some competition in fall, when male blue sheep come slightly lower for mating, and in winter when forage is scarce. Other effects include the presence of mastiff guard dogs, which can scare away wildlife and sometimes attack blue sheep, especially in the Lingzhi area. These dogs have also been vectors of gid disease (infection of a parasite *Coenurus cerebralis* which forms a cyst in the brain or spinal cord) in yaks, which might also be passed on to wild ungulates.

Destruction of regenerating plants, both in forests and on meadows, has been well documented. In broadleaved forests, the increasing dominance of invasive or low-seral species of plants such as *Eupatorium*, *Pteridium*, *Artemisia*, *Plantago*, and *Rumex* has been used as an indicator of decline in fodder quality due to continued grazing (Norbu 2001). Grazing was found to reduce the number and density of broadleaved tree species in a study of grazing effects on regeneration in mixed coniferous forests (Roder 2001). In such forests, important catchment areas require broadleaved species. The same study also restated that grazing did not destroy conifer species. In alpine meadows, Gyamtsho (1996) was alarmed at the yak-to-pasture ratio in the rangelands of Lingzhi and Laya, both of which are in JDNF. That study estimated that there was less than two ha of pasture per adult yak equivalent (YAE), with an estimated standing biomass of 400 kg DM/ha (based on clippings on grazed and ungrazed pastures). It is evident from these facts that livestock has a significant impact on the natural environment through its affects on regeneration and plant communities.

Livestock-biodiversity synergies

Livestock is an integral part of the Bhutanese farming system. Rice terraces have been enriched for centuries with organic manure from cattle-sheds composted with

leaf litter from the forest. Many families keep cattle for more than dairy products alone. In the alpine meadows, domestic as well as wild ungulates add nutrients to the soil with their manure. This is useful for the growth of many wild plant species, including palatable fodder species useful for wildlife. In some alpine areas, however; such as Lingzhi, Laya, and Lunana; this process is interrupted by the collection of yak dung for fodder and manure.

In areas like Phobjikha, grazing by livestock maintains the openness of the valley floor. Young shoots of dwarf bamboo (*Yushania microphylla*) and *Arundinaria racemosa* are nipped by livestock and prevented from growing tall, as they do in enclosures in the nearby areas of Longmey and Sengor in central Bhutan. Wintering black-necked cranes (*Grus nigricollis*) prefer this open habitat, as the increased visibility helps them see possible threats approaching from a distance (Caron and Wangchuk 1994).

In JDNP, the Tsharjathang valley is a special sanctuary protected as summer habitat for the Bhutan takin. As no livestock are allowed to graze in the valley in summer, there is adequate grass, which can be collected by herders when they bring in their yaks into the valley in winter. This helps solve problems of winter fodder shortage. At the same time, grazing of the valley by livestock in fall and winter alters the vegetation in a manner favourable to the takin (Wangchuk, 1999). The grass is grazed, and many forbs and shrubs grow in the disturbed areas, like *Aconogonum* spp. *Potentilla fruticosa*, and *Spiraea arcuata*, and are eaten by the takin.

From these few examples, it can be seen that there are also positive relationships between livestock and biodiversity conservation.

Development planning processes

Administrative units in Bhutan are divided into 20 dzongkhags, which are in turn divided into 202 'geogs' (blocks or communities comprising several villages) (Figure 3). With decentralisation of the planning process, local institutions such as the Dzongkhag Development Committee (DYT) and Geog Development Committee (GYT) play important roles in the development planning process. Village concerns are voiced at community meetings and, if endorsed by the GYT, are passed on to district-level meetings. Further endorsement by the DYT warrants that issues be moved to the National Assembly, the highest legislative body in the country. The planning process is molded into five-year development plans (FYP); the ninth five-year plan started in July 2002. FYPs are used as guidelines for annual plans.

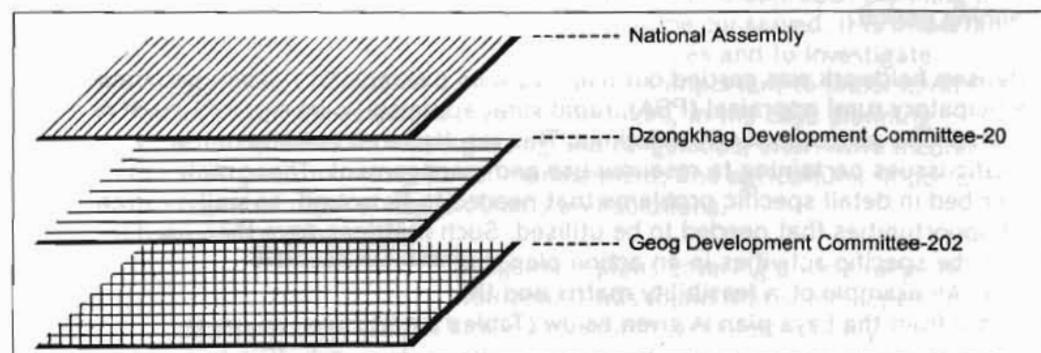


Figure 3: Three-tiered planning and decision-making hierarchy

Bhutan's development philosophy has been centred on maintaining a balance between sustainable resource utilisation and conservation of the natural environment. This is a shift from other development philosophies, wherein economic profit maximisation is the ultimate aim, often at the expense of the natural environment. A balanced development plan focuses on equitable distribution of costs and benefits; as well as on accommodation of religious, social, and cultural values.

JDNP has been working with local residents to assess resource use patterns, identify constraints, and develop management plans for sustainable use. Currently, the park is in the process of completing such plans for all of the ten major communities falling within the park. The first plan was made for Laya geog, and experiences gathered from this exercise were used to replicate the work in other communities. According to the draft Integrated Conservation and Development Plan for Laya (JDNP 2000), the basic premises for such collaborative involvement of the park in socioeconomic development planning of the resident communities lie in the following facts and assumptions.

- People living in the protected area may be considered park managers who derive a significant portion of their livelihood and cultural identity from the use of natural resources.
- There is a high level of uncertainty surrounding the setting of conservation objectives in a continually changing social and political environment (people's livelihood and land-use strategies, government policies, and rights of access to resources).
- Local people can contribute to the conservation of biodiversity if they benefit materially, socially, or culturally from the sustainable use of natural resources.
- The park itself has neither the capability nor the statutory responsibility to undertake many aspects of Integrated Conservation and Development Plan (ICDP) work, such as community development and agricultural extension, and must therefore collaborate with local governments and other local-level institutions.

Based on these premises, a community-based resource management plan called 'Integrated Conservation and Development Plan for Laya Geog' was developed for Laya geog by the ICDP team of the park in collaboration with the residents of Laya, other government agencies, and relevant stakeholders. The planning process involved building the planning capacities of key players – including village elders, government extension agents, planners, and park staff. A series of workshops and training sessions was held to train these people and to discuss issues thoroughly during the planning period.

Extensive fieldwork was carried out using various participatory planning tools such as participatory rural appraisal (PRA), rapid rural appraisal, participatory learning and action (PLA), and community meetings. This resulted in feasibility matrices for specific issues pertaining to resource use and management. These matrices described in detail specific problems that needed to be solved, as well as strengths and opportunities that needed to be utilised. Such matrices were then used to prescribe specific activities in an action plan that defined key players and a time frame. An example of a feasibility matrix and the corresponding action plan for tourism from the Laya plan is given below (Tables 1 and 2).

Table 1: Geog ICDP plan feasibility matrix**Geog: Laya****Problem/opportunity: Community management of tourism**

Potential action	Responsible	Some main activities	Who benefits	Expected benefits
Renovation of hot springs	Whole community	<ul style="list-style-type: none"> • Letter of acceptance to undertake the work as labour contribution • Submit budget requisition • Construct tanks and baths • Separate hot and cold water • Put roof over the baths 	Whole community	<ul style="list-style-type: none"> • Better health of the community: good for healing fractures and curing tuberculosis • Will be part of the tourist programme • Will help generate income from tourism
	Dzongkhag and JNP	<ul style="list-style-type: none"> • Financial support • Assist with work assessment and estimates • Assist with a management plan for using firewood for the stone baths 		<ul style="list-style-type: none"> • Reduce dependency on government supply of medicines • Mineral water will attract wild animals • Will promote tourism in the park
Mule track improvement and bridge maintenance between Laya, Lungo, and the hot springs	Whole community	<ul style="list-style-type: none"> • Acceptance letter to the dzongkhag that labour will be contributed by community • Budget requisition 	Whole community	<ul style="list-style-type: none"> • Will make hot springs more accessible to tourists and other guests • Easier access to monastery and pastures • Will contribute to better tourism management • Less disturbance to wildlife by following a single track
	Dzongkhag and JNP	<ul style="list-style-type: none"> • Site visit and assist with assessing the work required • Financial support 		

(Source: JNP 2000)

It became evident from the planning exercise that in order to realise conservation objectives (or any other specific objectives), it is important to approach planning from a very comprehensive angle. In order for biodiversity to be conserved, it is important to look into ways of reducing pressure on natural resources and to investigate sustainable management alternatives. In doing so, it is important to understand the socioeconomic implications of such activities. Therefore, in the Laya planning process, specific focus areas included grazing and rangelands, alternative income generation (including eco-tourism), forest management, and agriculture. Importantly, the residents suggested most of the problems and solutions.

Using similar approaches, resource management plans covering a wide range of rangeland and livestock issues were developed. It was found that some activities required financial inputs, such as pasture improvement, while others only required a shift in policies and attitudes, such as allowing for controlled burning of some pasture areas.

Table 2: Geog ICDP detailed action plan**Geog: Laya****Problem/opportunity: Community management of tourism**

Activity	Detailed steps including monitoring	Who responsible	Year 1											
			J	A	S	O	N	D	J	F	M	A	M	J
Renovation of Geyza Tshachu	Survey the site to assess the work required, agree on design, and prepare estimate of costs	JDNP, Dzongkhag, and members of the community												
	Send a letter of acceptance to the dzongkhag to do the work under labour contribution	Gup (village head) and community												
	Construct the baths, divert cold stream waters away from the spring, place roofing over the baths	Community under Zhapto Lemi												
	Develop a management plan for sustainable use of the surrounding forest to provide firewood to heat stones	Community and JDNP												
	Establish a management scheme that generates income for the community	JDNP, dzongkhag, community, and Department of Tourism												
	Monitor the use of the Tshachu by tourists and other guests	Community												
Mule track improvement and bridge maintenance between Laya/Lungo and Tshachu	Monitor the income generated and its distribution within the community	Community												
	Visit and assess site and prepare estimates	Dzongkhag, JDNP, and community												
	Send a letter of acceptance to the dzongkhag to do the work under Zhapto Lemi	Gup and community												
	Improve mule track and repair bridge	Community under Zhapto Lemi												
	Monitor use of the improved track to ensure that other tracks of conservation interest are not used	Community and JDNP												

(Source: JDNP 2000)

Integrating the ICDP plan with the geog plan

Bhutan has embarked on a decentralised planning process called geog-level planning, wherein each geog creates its own development plan. Such plans will cover all developmental needs – such as education, health and sanitation, trade, access and communication infrastructure, and agriculture and livestock services. The ICDP plan developed by JDNP for Laya must mesh with, and become part of, the geog plan in order to avoid duplication of effort and wasting of resources. The ICDP plan, although covering different aspects of socioeconomic development, has a conservation bias in that it ultimately aims to conserve biodiversity through other activities. The geog plan,

therefore, which focuses only on development, will cover areas left out by the ICDP plan. To complete the integration process, the approach illustrated in Figure 4 was used.

Integration of the community plan into the dzongkhag plan remains a big challenge. It takes a considerable amount of time for the dzongkhag authorities to accept the issues and activities prescribed within ICDP plans as priorities for the people. Long experience with centralised and target-driven planning processes makes it difficult to allow local plans to take precedence.

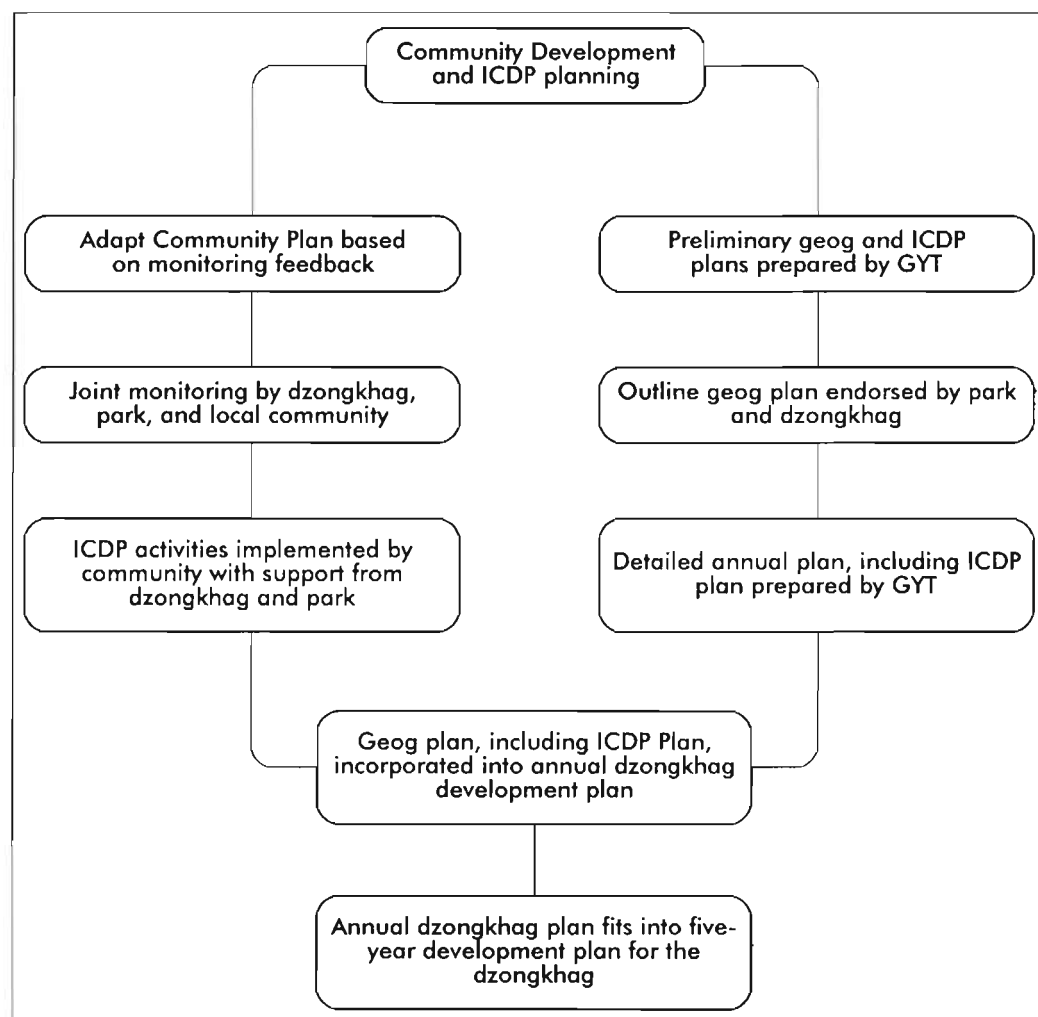


Figure 4: Integrating process for ICDP planning in JDNP

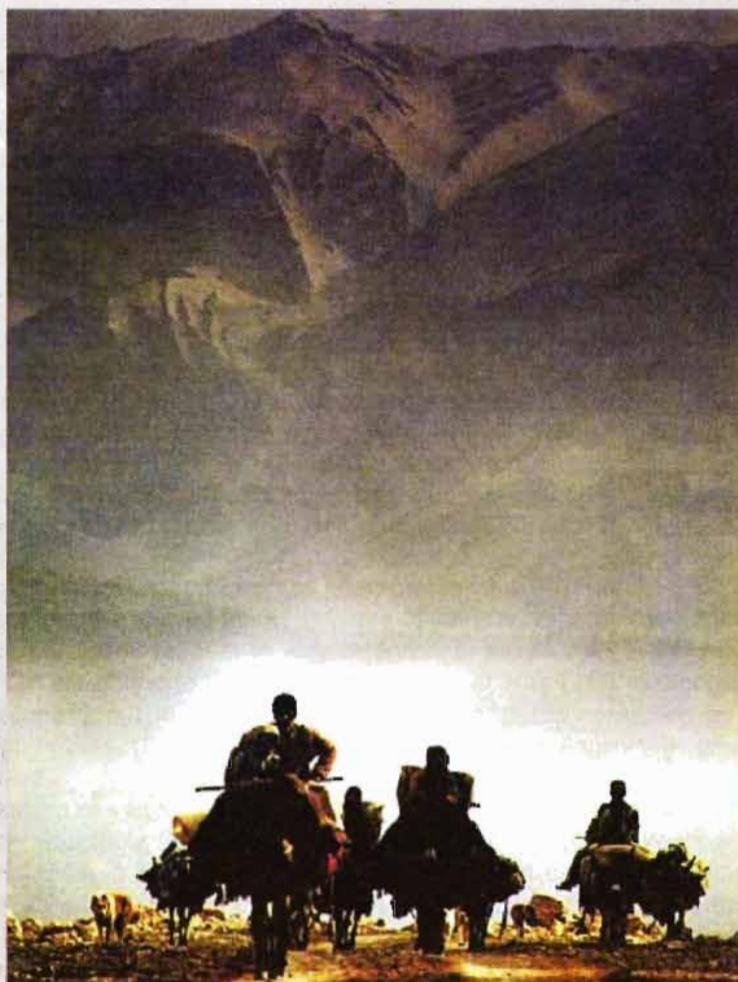
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Pastoralists, Government, and Natural Resources in Iran: Organisational Learning in the Forest and Range Organisation

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Introduction

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 'balance' between ecology and economy through long-time co-adaptation with their environments. All of this has certainly changed over recent decades, with nomads now being held responsible for very significant degradation of the rangelands over which they migrate with their livestock. Indeed, the situation has degenerated to such an extent that the very nomadic lifestyle and continued existence of these transient pastoralists is considered by many to be under severe threat.

A number of very significant dilemmas characterise the situation.

1. Nomadism is often viewed as responsible for degradation of the natural resource base, with particular respect to very extensive areas of soils eroded through over-grazing. Yet, roughly one third of the total area of Iran (164 million hectares) is unusable for any purpose other than pastoralism. If the nomadic way of production ceases, it is difficult to conceive of other economically productive uses for this land.
2. The utilisation of rangelands by nomadic pastoralists is characterised by low levels of productivity. Yet, although they represent only a small proportion of the population, even in rural areas, nomads are the main breeders of indigenous species of livestock in Iran, providing breeding stock for the rest of the livestock industry in the country, including large-scale commercial livestock enterprises.
3. Poverty and low levels of social welfare among nomadic peoples are causes for significant concern to government agencies committed to matters of equity and social justice. Yet, while a large proportion of the nomadic population now wishes to improve their own welfare through settlement, the government does not enthusiastically support such a strategy for a number of reasons, including those above.
4. There is increasing national concern about the deterioration of the diverse cultural identity and heritage of nomads. Yet, with their capacity for independent action, there are concerns that nomads pose potential problems of control for the government.

Conventional strategies for development have generally failed to identify, or at least to respect, the complex inter-relationships that exist between all of these different factors. It is not surprising, therefore, that the strategies adopted over recent years are not now considered to have been the most appropriate. These have included attempts to achieve the following:

- political control through military intervention and enforced settlement,
- protection of natural resources and improvement of production through natural resource redistribution and 'transfer of technology' models, and
- modernisation of social features through introduction of social services associated with sedentarised communities. Active nomadic support for government-initiated activities has been limited, while the rate of unorganised settlement continues to increase.

Natural resource degradation seems to be the most important and growing concern, and it has not been addressed by resource redistribution, technology, or conservation strategies. The underlying theme of this paper is that the relatively limited achievements in nomadic development and natural resource conservation stem from the fact that policies are:

- based on a reductionist point of view and an analysis that separates theory from practice and neglects the diversity, and complexity of nomadic life; and
- developed on the basis of government perceptions of the nature of the issues confronting nomads, rather than on the basis of concerns expressed by the nomads themselves.

It is argued here that the current approach to development activities must shift from conventional empiricism, with its linear logic and power relationships, to models which endeavour to establish systemic and mutual recognition and accommodation of change among 'clients' with the researcher as facilitator.

Process of action research

There were three phases of inquiry in this study, which when taken together, represent what might be termed a 'system of participatory methodologies'. The aim of the first phase was to explore the complexity and diversity of the current problematic situation. The second phase of research was to assist nomads and various government agencies in understanding each others' perspectives and to go beyond the 'symptom' to find common issues and goals. The third phase of research was designed to facilitate organisational change within the Forest and Rangeland Department. Table 1 summarises these three phases and describes the process in more detail.

Exploration phase: ethnographic research

The first phase of the research comprised an ethnographic study of the bonkoh as a 'human activity system' (Checkland 1981), a group of people carrying out a certain set of functions pertinent to the research question. In this case, the question involved what the nomads themselves perceived as threats to their welfare and cohesion as a purposeful group of nomadic pastoralists.

The bonkoh was considered an appropriate level for intervention and study for the following two reasons. First, it is territorially identifiable and acts as a 'system' for the purposes of environmental management, both in summer and winter quarters.

Table 1: Summary of the long-term PAR process used in this research

PHASE I. Exploring the situation				
Nomadic Group (23 extended families)	Forest and Rangeland Department	Department for Nomadic Welfare	Livestock Department	Central Government (Department of the Interior)
Priority Concerns				
<ul style="list-style-type: none"> • Education • Health • Declining income • Sense of powerlessness to change their situation 	<ul style="list-style-type: none"> • Overgrazing by livestock • Resulting desertification • Viewed nomads as 'the problem' 	<ul style="list-style-type: none"> • Poverty alleviation among nomadic communities • Provide mobile services such as health, and education 	<ul style="list-style-type: none"> • Increasing production of livestock to meet market demand 	<ul style="list-style-type: none"> • Concern with potential independent actions of mobile communities
<p>Situation for Nomads: saw a crisis in their livelihoods because of the following.</p> <ul style="list-style-type: none"> ⇒ They were crowded into smaller and smaller rangeland areas (large areas lost to agriculture and urbanisation) ⇒ High demand for meat thus maintaining large number of animals ⇒ Lost spring and fall corridor pastures thus had to quickly truck their livestock between summer and winter pastures, increasing the time spent in those areas which led to overgrazing ⇒ With reduced productivity of rangelands, they were making less money from livestock, thus forced into migrant labour ⇒ Technical interventions promoted by the Livestock and Forest/Rangeland Departments did not match their perceived needs 				
PHASE II. Assisting both nomads and government agencies to understand each others' perspectives, and finding common goals				
<p>Process</p> <ul style="list-style-type: none"> ⇒ Presented results from Phase I to various government groups to present perspectives of nomads and competing government agendas ⇒ Formed small PAR teams within these groups to discuss issues and make field plans for exploratory studies with new nomadic groups ⇒ PAR teams initiate dialogue with nomad groups to improve relations ⇒ Form new PAR teams composed of government staff (multiple departments) and nomadic representatives for long-term facilitation 				
PHASE III. Facilitating Organisational Change within the Forest and Rangeland Department (on-going)				
<p>Process</p> <ul style="list-style-type: none"> ⇒ Formed PAR teams within the Forest and Rangeland Organization ⇒ Team members strategically selected so that they had the ability to bring about change (change agents) ⇒ Conducted series of workshops within divisions using participatory tools to collectively reflect of past experiences and current issues ⇒ Established the Department of People's Participation ⇒ Established a research centre in a nomadic area that is run by the communities and facilitated by government staff 				

Second, it acts for a number of other purposes as a cohesive group, providing a basis for collective action even if the higher level of tribal organisation no longer functions (Emadi et al 1992).

Critical reflections on this phase of the research by the researcher-as-participant/observer confirmed the following: a) the complexity of the current situation as perceived by the nomads themselves; b) the unease of the nomads in their present situation; c) the lack of any sign of improvement in future trends as seen by the nomads; and finally d) an essential need for improvement in the mutual understanding between government officials and nomads. Without changes in the relationships between nomads and agents of the government, there was a strong feeling within the bonkoh that the circumstances were 'not improvable'.

Negotiation phase: assisting nomads and government agencies to understand each others' perspectives

Reflection on the outcomes of the first phase of the research led to the submission that a more action-oriented or 'development-focused' approach to the research would represent a potentially important innovation in a situation, which currently seemed irresolvable. In other words, the apparent irresolution of the situation in which the nomads believe themselves to be suggested the need for an approach grounded in a context of 'research through action for development'. In turning now to an action-oriented approach to research, the researcher was extremely conscious of the two quite different 'traditions' which characterise it. As Brown (1983, 1993) has proposed, there are profound differences between what he termed the 'northern tradition' of action research (AR) – with its emphasis on organisational change through problem solving – and the 'southern tradition' of participatory action research (PAR) – which has been developed in the context of the 'empowerment of disempowered communities' of the so-called third world. At first glance, each of these two approaches would seem to have relevance in the present context; the 'northern' tradition being perfectly relevant for exploring changes in the organisation of government agencies to more closely fit the self-espoused needs of the nomads, and the 'southern' tradition being highly appropriate to nomadic communities in their search for greater empowerment and for their participation in planning and decision-making processes.

Therefore, the researcher chose an approach which combined both types, by adopting a more or less conventional AR approach to work with agents from relevant government departments, who in turn would be encouraged to practice a PAR approach to the end of encouraging much greater participation by nomads in the quest for 'improvements in their situations'. Thus, action research teams were formed, comprised of local officers from the different government departments concerned with nomadic issues, including the Forest and Range Organization (FRO), the Organisation for Nomadic People (ONPI), under the Ministry of Jihad-e-Sazandegi, and the Budget and Planning Organization (BPO), as well as the researcher as facilitator. The team was faced directly with the problematical situation perceived by a range of stakeholders, including representatives of nomadic communities. The first task of the action research team was to understand the general situation of the nomads in terms of various issues. We explored the nomads' views about their situation, main concerns, interests, and issues. We then identified their ideas and views about government services and their relevance to nomads'

needs and issues. Finally, we jointly explored with the nomads possibilities for improvement in the provision of these services.

Previously, the officers had had an abstract perception of the situation. Through collective viewing of the situation and discussions, they were able to see the impact of the projects of their various agencies upon the projects of other agencies. They began to see that the projects interconnected in ways which had not previously been recognised or considered.

An example is relevant here. When a small water reservoir is built by ONPI, the herds of nomads will congregate in that particular area, which causes overgrazing. This problem of overgrazing is the responsibility of FRO. In addition, ONPI has built a road into the area, which means that the nomads can now transport their water by vehicle and thus do not need the reservoir in this particular area. They need the reservoir in an area not accessible by road.

Collective reflection on and explanation of the social context based on direct observations by the officers led to an environment in which all participants were able to look at the situation from the perspective of other organisations. They became familiar with the wide range of activities and projects being implemented at the regional level and were able to examine their previous and current strategies and policies toward the nomads. The situations they observed highlighted interconnections in the social context.

When the officers had conceptualised their findings, theoretical input and discussion was introduced to inform their findings and practice. Relevant theories were introduced as aids in expressing their findings, which they were not able to express in conventional scientific language and logic.

At this time, some nomads were invited to share their views and perspectives on various projects with the government officers. This was an attempt to introduce the nomads' views and perspectives on the situation and to include their perspectives in the ensuing discussions.

Confronting the participants on different occasions with nomads and their capabilities assisted the process of understanding in depth the theory of participation. When the nomads' language and logic was interpreted and contextualised by the facilitator, the participants became more familiar with the idea of the nomads' indigenous knowledge and its importance in the process of decision making for change and development. It became clear during these meetings between government officials and nomads that the nomads were able to see and understand outcomes of various projects while they were in the planning stages.

In brief, the dynamic of this continuous process was that, first, the officials had a regular meeting with all camps of the Ghareghani clan. Second, we had a regular group discussion among the officials, based on the daily visits and observations, in order to keep the process of action and reflection in line with a participatory approach. Before I begin the discussion of this process, I will briefly describe the organisation of the Ghareghani clan.

The Ghareghani bonkoh, the largest remaining part of the Ghareghani sub-tribe and part of the Dare-Shori tribe, is part of the Qashqai tribal confederation. The Qashqai consists of five 'taifeh' (tribes), which each consist of several 'tireh' (sub-tribes), which in turn consist of a number of bonkoh. Each bonkoh consists of several 'urdo' (camps), which stay in particular summer and winter regions and consist of one or more 'siyah-chador' (tents or families); thus, the household is the smallest unit of tribal organisation. A group of households with common kinship is called a 'beyleh'; like most clans, the Ghareghani bonkoh consists of several beyleh with differing origins and histories. The largest beyleh in the Ghareghani clan is Taleb-lu and considers itself Turkish. Thus, the Ghareghani are Turkic-speaking but use a dialect significantly different from urban Turkish; most tribesmen also speak Persian and Luri. The primary neighbours of the Ghareghani in both winter and summer camps are other Qashqai tribes (Emadi 1995).

The process of the regular meetings and discussions held with the Ghareghani can be summarised in the three following points:

- equalising the context and facilitating interaction for effective communication between team members and nomads;
- facilitating a learning environment in which all participants were informed and could consider other perspectives that were presented;
- exploring the possibilities and facilitating the processes for situation improvement.

Regular group discussions among team members were conducted as a means of collective reflection on daily personal observations and organisational perspectives of each member. My role as facilitator was to establish an environment for negotiation between participants, and at the same time create an opportunity for all of us to see the situation in a different way, in a broader and longer-term framework considering different viewpoints.

Creating and maintaining a learning environment among all members was the most crucial task. Appreciation and respect for the personal, professional, and organisational perspectives of others, and more importantly, keeping in mind the nomads and their perspectives in discussions of daily observations and activities, were major elements in the process of learning.

The action phase of the research included 'actions to broaden the perceptions of the government agents' as well as 'actions to practice novel participative research approaches to development'. Reviewing past experiences of various organisations' projects, and focusing on the actual outcomes in the light of the social realities, was a way of learning, which on several occasions transformed the attitudes of the officers toward current approaches to development. Taking a wider perspective, rather than a purely organisational one, and focusing on a bonkoh (clan) enabled them to see the effects of various organisational strategies and their inappropriateness within the social context and nomads' needs. Hence, they gained insight into the nomads' problematical world created by the very policies and actions that were generated based on their own perspectives.

During each session, we reviewed the whole process from the meta-level to see 'what we learned' and 'how we learned' (Bawden 1990). The concepts of social practice and research (action research), experiential learning, and systems thinking were very

unfamiliar activities to all participants at the early stages of this research. On many occasions, they were very uneasy with the situation resulting from this way of thinking and viewing matters. Continued practice and observations on its outcomes made this process more understandable and comfortable. What came as a surprise for most involved was discovering unique possibilities for improving the situation for all members of Ghareghani and the action research team, without any fundamental investment or transfer of technology.

Among the outcomes of this second phase of the research were clear agreement within the action research teams regarding 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'. (The above-mentioned failure included the perceived failure to achieve any sense of shared meaning between nomads and government agents.) There was also the crucial outcome of new action-research development practices by the agents, and the appreciation of this innovation by the nomads.

Organisational learning phase: facilitating change within government agencies

Reflection on the outcomes of the second phase of the research showed that changes in the attitudes and beliefs of practitioners to 'see things the other way around' are crucial. To start and maintain this crucial change in the attitudes of practitioners and specialists towards people and resources required new strategies for institutional change and action research in organisations, such as 'learning to learn', and 'learning to help in participative ways'. The above-mentioned reasons, as well as the need for up-scaling the outcomes of the research, led us to offer an intensive workshop for FRO officers. The learning process, and the learning strategies behind this phase of research, can be summarised as follows:

- creating a critical learning environment;
- collective reflection on past experiences and current problems;
- assisting the participants to see their views toward the problematical situation from a meta-level;
- introducing systems thinking as a new way of looking at the situation;
- supporting participants in creating a new strategic plan for future action;
- reviewing and evaluating the whole process as a new way of monitoring, planning, researching, and learning.

The programme of the workshop was carefully designed by the facilitators to meet the proposed goals and to follow the theoretical position and the above learning strategies. The major learning themes of the workshop focused on three different areas:

- fundamentals of experiential learning;
- systems thinking; and
- people's participation in natural resource co-management.

The learning process was facilitated through four learning tasks, including:

- group discussions and teamwork;
- propositional inputs, including lectures and learning packages;
- field trips; and
- personal reflection on the process, through preparation of a paper by each participant.

The programme of the workshop was designed for thirteen working days in such a way that the four major learning tasks complemented each other to maintain a continuous process of action and reflection. At the end of each task, and after personal questions and comments by the participants, a group discussion was conducted to facilitate group reflection on the content and process of the workshop.

The essential metaphor introduced during this event was that of the organisation as a learning system as distinct from a regulating system. What we were facing in the process of the workshop was a combination of various barriers among some participants, particularly the perceptual barrier about local people and their role in natural resource destruction. But we were witness to a shift among the majority of participants in their way of looking at the situation. The shift was particularly obvious among technology-oriented practitioners towards recognising the impact of social issues on ecology. Due to the tremendous diversity of personal, professional, and organisational backgrounds of participants, there were significant clashes among them about ways of looking at and conceptualising the experience and collected data. What made these contrasts fruitful to all participants was the applied methodology, which considered this diversity of viewpoints as a source of building rich scenarios, and also led to sharing different perceptions of the issues. Considering the same reality from different angles and perspectives helped all participants move from their strict discipline towards a multidisciplinary perspective, and even beyond that to an interdisciplinary approach to analysing the situation. According to the evaluations of the workshop, these interactions proved to be the most valuable aspect of the workshop, while the inputs and lectures of invited academics and researchers were found to be irrelevant to their current complex and changing situation.

Feedback from the participants in this workshop confirmed the fact that there were significant transformations in ways of thinking about the complex relationships between nomads in Iran, the environments in which they live and work, the technologies that they use as pastoralists, the agents of government departments concerned with these aspects of sustainable development, and Iranian society as a whole. The outcomes of this phase showed that there is an ongoing need to review how we go about our 'seeing' and our 'doing', if we are to improve on current, apparently intractable, complex situations (Bawden 1990).

Conclusions

To bring about a transformation in organisational performance requires a commitment to a long term process of institutional learning and flexibility in approaches. The three phases of this action research process were organised differently, with different actors involved at each step making up different PAR teams; as issues changed, so did the approach. The PAR process also allowed actors to go beyond differing perspectives and find common goals. They went beyond the 'symptom', e.g. overgrazing, to treat the cause, restricted mobility, by improving mobile services, and by testing innovations directly with the community. The PAR process also improves government coordination. Often government policies oppose one another due to competing mandates of organisations. By working as teams across departments and with communities, these departments are slowly integrating and becoming more needs based.

The overall outcomes of this process include:

- improved understanding of nomadic perspectives by government staff;
- improved relations between nomads and some government staff;
- more successful project implementation in nomadic areas;
- reorganised extension to address nomadic service issues in an inter-disciplinary manner (the Department of People's Participation established);
- improved delivery of mobile services to nomads by Department of Forest and Rangelands;
- contribution to knowledge about nomadism in modern day Iran, thus increased cultural understanding among the wider urban public.

What made this process successful was primarily the presence of a dedicated facilitator who committed to the long-term process and was in a position of power within the Ministry of Agriculture. The author also received the support and cooperation of government departments (primarily the Forest and Rangeland Organization). And fundamental to it all was the adoption of the value 'working for the people, with the people, and by the people'.

However, there are a number of continuing challenges. The issue of upper level policy support is ever present, along with issues of inter-departmental cooperation and competition. Regardless, the initiation of this process and its success to date will continue to ripple through the Ministry and to their 'clients'.

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