

AGA KHAN RURAL SUPPORT PROGRAMME  
BALTIISTAN



# **HIGH ALTITUDE INTEGRATED NATURAL RESOURCE MANAGEMENT**

**REPORT NO. 9**

**ANNUAL PROGRESS REPORT 2000**

**Josie Teurlings  
Ingrid Nyborg  
Mohammad Akbar Raza  
(EDS.)**

**AKRSP - NLH, JANUARY 2001**



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***HIGH ALTITUDE INTEGRATED NATURAL RESOURCE MANAGEMENT:***

This is Report No 9 (*Annual Progress Report 2000*) of a report series presenting the activities and preliminary findings of joint research under an institutional cooperation programme between the Aga Khan Rural Support Programme, Pakistan, and the Agricultural University of Norway.

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**AKRSP:** Mohammad Akbar Raza, Manager Agriculture.

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**PROJECT REPORTS**

Report No. 1: Summary report 1998  
Report No. 2: Institutions and organisations in pasture and forestry management 1998  
Report No. 3: Pasture, livestock and biodiversity 1998  
Report No. 4: Natural forest inventory 1998  
Report No. 5: Gender, resource management and livelihood security 1998  
Report No. 6: Information and documentation 1998  
Report No. 7: Socio-economic survey of Basho (project site) 1998  
Report No. 8: Annual Progress Report 1999  
Report No. 9: Annual Progress Report 2000

More copies of the reports may be obtained from AKRSP, Regional Programme Office, Skardu or Noragric's Library.

## Overview of project components and counterpart team leaders

More team members are listed in Appendix 1.

Project	NLH	AKRSP
<b>Institutions and organisations in pasture and forestry management</b> (property rights and other formal and informal institutions interpreted as the rules for behaviour; organisations/actors within the institutional framework)	Håvard Steinsholt	M. Akbar Raza
<b>Pasture, livestock and biodiversity</b> (the dynamics of high pasture management, fodder demand and fodder production, quality assessment for land use planning and conservation of soil and vegetation)	Øystein Holand/ Per Wegge	Mohammad Afzal
<b>Farm forestry and natural forest assessment</b> (forest and tree resources assessment, regeneration evaluation, and analysis of the supply and demand of forest products and linkages between farm-forestry practices and natural forest)	Knut Velle/Heidi Asbjørnsen,	Jawad Ali / Wazir Shabbir Hussain
<b>Farm resources</b> (linkages with “below the channel” resources, which include land, crops and trees, and how different groups of households fuse private and common pool resources in livelihood strategies)	Åge Nyborg	M. Akbar Raza
<b>Gender, resource management and livelihood security</b> (dynamics of changes in women’s and men’s use, access to and control over resources, and the effects of changes on household food security)	Ingrid Nyborg	Kulsoom Farman
<b>Information and documentation</b> (creating a common information resource base relevant to all project sub-themes, facilitating exchange of information between project counterparts in Baltistan and Norway and supporting AKRSP Baltistan’s efforts in networking for information access)	Liv Ellingsen	M. Yousuf
<b>Coordination</b>	Poul Wisborg/Ingrid Nyborg.	Mohammad Akbar Raza

The programme is implemented in cooperation with *the Basha Development Organisation, Northern Areas Forest, Parks and Wildlife Department, the World Conservation Union (IUCN)* and other local institutions.

## **Preface**

The Aga Khan Rural Support Programme (AKRSP) and the Agricultural University of Norway (NLH) have entered a cooperation programme on alpine resource management. The programme was planned during mutual visits in 1997 and implementation started in March 1998. The programme is funded by the Norwegian Agency for Development Cooperation (NORAD) as an integrated part of Norwegian support to AKRSP's natural resource management (NRM) programme in Baltistan.

During 1998 the partners initiated an integrated study of alpine resource management systems (pasture and natural forest) in the Basho watershed of Skardu District. From 1999, the partners have entered a three year period of co-operation, based on NORAD's approval of AKRSP's application for a total of NOK 4.0 million for the continuation of the cooperation project during the period 1999 - 2001. Total NORAD support to the NRM programme during the same period has a frame of NOK 13.2 million. NORADs support to AKRSPs NRM programme will also continue after this period.

The Annual Progress Report 2000 briefly outlines the project objectives, focus and components and the main activities and results during 2000. It assesses overall progress and makes general recommendations about the continuation of the programme.

## **Acknowledgements**

*In both the initiation phase and the continuation in 1999 and 2000, participants have enjoyed the opportunity to carry out field research in the Basho watershed of Skardu District. We want to thank again the people of Basho, the village organisations and the Basho Development Organisation (BDO) for a warm reception, permission to expand the range of activities and for exceptional hospitality and support. BDO leadership, President Ghulam Rasool and General Secretary Mohammad Younus Shehzad, not only approved and facilitated the cooperation programme, but also participated actively in carrying out several activities and discussing research findings. Men and women of the eight villages of the watershed have again contributed of their valuable time and knowledge. The active and committed participation by Nazimabad villagers in a goat productivity experiment is just one example. In 1999 and 2000, we experienced the advantage of coming back, and of being able to both meet more villagers (for instance visiting Bathang in the lower part of the Basho watershed) and of enjoying deepened relationships with some groups and villagers (particularly in Sultanabad). The maps, reports, photos and other documentation that we have been able to provide to local people and the schools of Basho watershed are, indeed, only small tokens of our appreciation. While it is impossible to name all, some individuals from Basho who made a special contribution have been mentioned in the list on the following page.*

*This year's work, however, has also been directly touched by two tragedies. In May, our field assistant Muhammad Ashraf was murdered while working with us in Basho Valley. We continue to feel for his family and will never forget the contribution he made to both the project and to our personal lives through his dedication and friendship. The second tragedy has been the passing away this fall of the Norwegian researcher Knut Velle, after a long period of illness. His contribution to the project through his initiation of the first forest inventory in the Northern Areas is greatly appreciated, and he will be sadly missed as we continue the work which he started on forest regeneration.*

*We thank the District Commissioner, Skardu, Haji Sanaullah and other government officials, for their interest in the collaborative programme and for offering useful recommendations and advice, and in some cases active participation in the programme. The Divisional Forest Officer, Skardu, Mr Sharif, again generously offered the Forest Department Guest House in Basho for use by AKRSP and visiting researchers.*

*We thank NORAD and the Royal Norwegian Embassy, Islamabad, for the continued support and for the consistent good will towards the cooperating institutions, as well as active interest in the challenges and development potential of Baltistan and the Northern Areas at large. We were very honoured by the visit of Bjørn Johannessen, Arshad Gill and Gunnar Zachrisen to Basho Valley this field season.*

*AKRSP made excellent arrangements for field research. All Norwegian participants sincerely appreciate the many efforts without which we would not have been able to carry out our work in Baltistan. The NLH team is pleased to have been able to welcome the AKRSP team to Norway this fall and to show and discuss the Norwegian way of high altitude integrated natural resource management.*

*Support by local people, government institutions and the donor agency will remain a condition for the project to achieve its goals. The partners appreciate with humility the good relations and many contributions they have enjoyed so far. We hope that the linkage programme may continue and grow to the benefit of local people, the co-operating institutions and relevant government authorities.*

*Ås, January 2001*

*List of some individuals from the Basho watershed who made special contributions.*

Ghulam Rasool, Nazimabad (VO Manager, BDO President)

M. Younus, Guntho (VO President, BDO General Secretary)

Haji Dulat Ali, Sultanabad, Elder

S. Hassan, Sultanabad, School Teacher

Ghulam Hassan, Sultanabad, School Teacher

Salman Ali, Sultanabad, WO Manager;

Haji Shifa, Sultanabad, VO Manager

Mirza, Sultanabad, Elder

Haji Muhammad Haider, Nazimabad, President, Conflict Resolution Committee

Ahmed Shaheen, Nazimabad, VO President

Hussain, Nazimabad, Member

Akhund M. Khan, Guntho, VO Manager

Ali Hussain, Meito, Member

Fida Muhammad, Meito, VO Manager

Syed Talib Shah, Khar, VO Manager

Ghulam Hassan, Bathang, President Conservation Committee

Akhund Ibraheem, Nazimabad

Ghulam Abrahass, Doros, Member

Qambar Ali, Doros, Member

***Field assistants/field guides***

Muhammad Ashraf

Ghulam Abbas

Muhammad Din

Ali (Cook)

Sekandar (driver)

***Other resource persons:***

Mr Muhammad Musa, Manager VO, Bathang

Mr Fida Muhammad. Manager VO, Meito

Shamsheer (herder)

Abe Diin (herder)

Zehra, Zebu, Saida & Khanum from Nazimabad, who sorted all the plants.

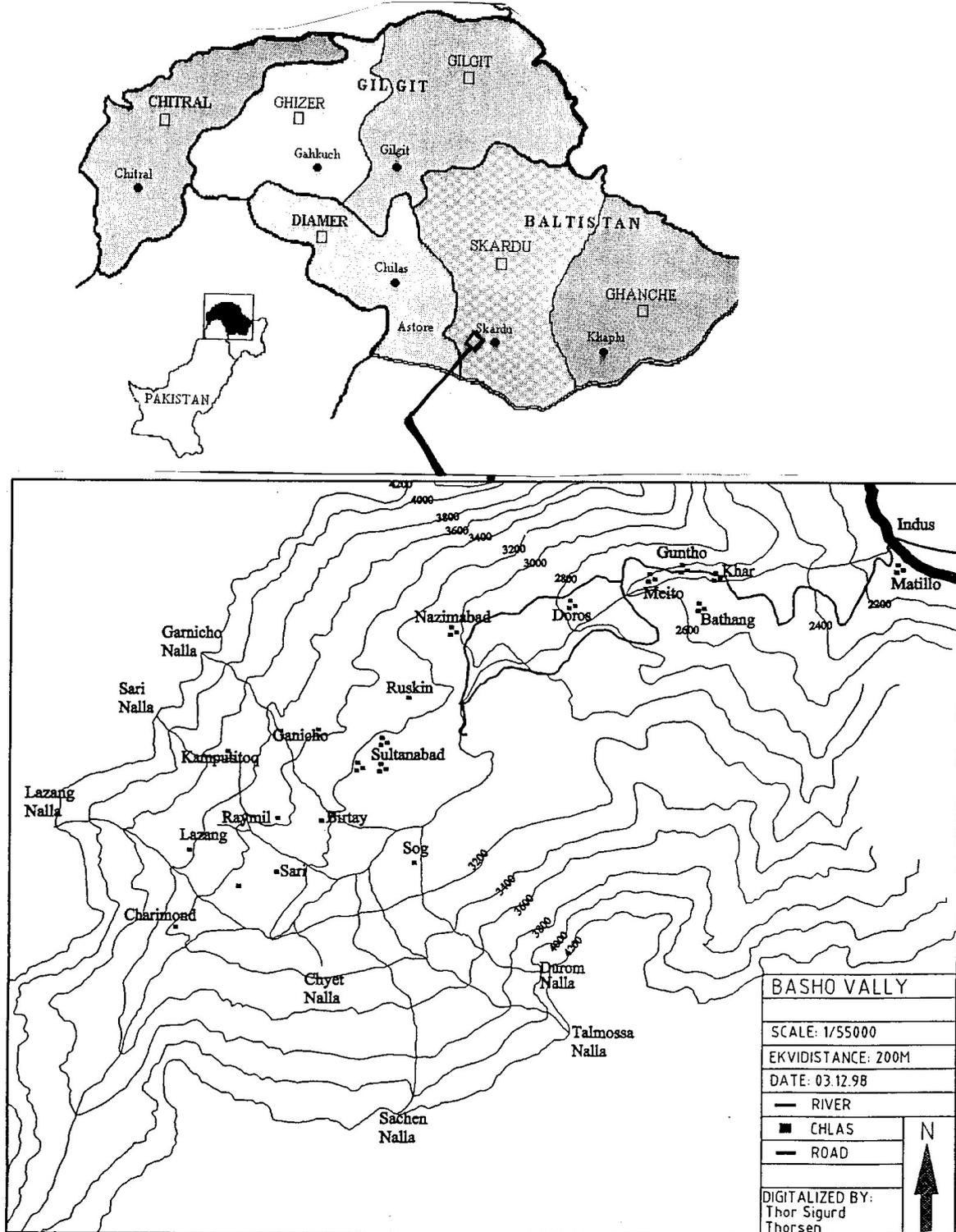
Yonus Shehzad (key informant and translator)

Goat owners and VO in Nazimabad

**List of acronyms and abbreviations**

AKRSP	Aga Khan Rural Support Programme
BDO	Basho Development Organisation
DFO	Divisional Forest Officer
FMU	Field Management Unit
IUCN	International Union for the Conservation of Nature
JMM	Joint Monitoring Mission
NRM	Natural Resource Management
NLH	Agricultural University of Norway
NORAD	Norwegian Agency for Development Cooperation
Noragric	Centre for International Environment and Development Studies
UNDP	United Nations Development Programme
VO	Village Organisation
WO	Women Organisation

Map of the Basho Watershed and its location within Pakistan





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## 1. INTRODUCTION

### 1.1 AKRSP – NLH CO-OPERATION

The context of this report is the agreement between AKRSP and NLH to cooperate on a combined programme of competence building and applied research on High Altitude Integrated Natural Resource Management (Project document: NLH - AKRSP, 1997). It is stated here that:

*The aim of the institutional cooperation programme is to gain further insights into pasture and forest resources and their role in farmers' livelihood systems. Participatory, applied research shall enhance the capacity of AKRSP to work with village organisations and partner institutions for sustainable management of pasture and forestry resources, through providing knowledge which may be used in developing management and conservation strategies, initially at project sites.*

The specific objectives relating to AKRSP are:

- To expand the knowledge of the resource systems of Baltistan through a joint research project in order to enhance the capabilities of project staff to respond to the challenges of integrated resource management in high-altitude areas
- To improve AKRSP documentation and extension systems with respect to forestry and pasture
- To improve AKRSP's links with national and international research institutions

The specific objectives relating to NLH are:

- To strengthen its knowledge-base for development-oriented research in the region and within fields where NLH is already working
- To gain the opportunity for carrying out applied, participatory research together

with an implementing NGO and farmer-based organisations

- To provide an opportunity for staff, students and ex-students to gain field level working experience in Baltistan, Pakistan

The main activities in the programme are:

- planning and conducting joint, participatory field research/documentation
- training and capacity building for AKRSP staff, primarily through joint research/documentation
- disseminating and sharing knowledge gained through workshops, training sessions, networking and publications
- exchanging information, references and literature through a library link for improved networking and information management
- offering technical advice for field-level application of the knowledge generated through research

The project is based on AKRSP strategies to increase its work on pasture and forest issues. The AKRSP Programme Proposal 1997 - 2001 states that,

*“the goal of the Natural Resource Management (NRM) programme is to improve the living standards of people in northern Pakistan through building local capacity for more productive, integrated and sustainable management of their natural resources.”*

The proposal indicates an increased strategic emphasis on “above the channel” resources:

*“..in the next phase, AKRSP intends to make environmental concerns a greater part of its planning and programming.....NRM efforts will have environmental interests as one of its central aspects ..... alpine pastures and natural forests will be included in the discussion of village and watershed plans...”.*

The 1997-2001 proposal also addresses the institutional challenges involved when above the channel resources and wider environmental concerns are given a more prominent status:

*“Subject to future agreements, AKRSP will, in principle, support joint Government - VO/WO initiatives in forest conservation and pasture development”....“links with IUCN biodiversity projects have already been established..”.....“pasture development will be integrated with watershed level planning....appropriate user-based institutional arrangements for improved pasture management will be introduced....”*

## 1.2 FOCUS AND COMPONENTS OF THE STUDY

Based on joint planning workshops in Norway and Baltistan, the partners formulated a project focusing on high altitude natural resources.

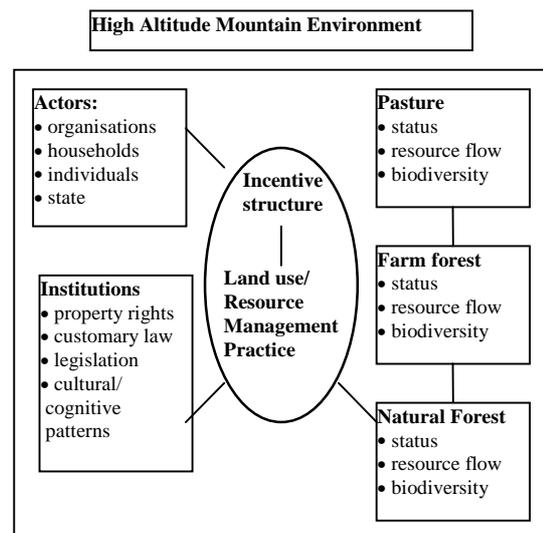
This project has the following 6 sub-themes with counterparts from AKRSP and NLH:

1. Institutions and organisations in pasture and forestry management (property rights and other formal and informal institutions interpreted as the rules for behaviour; organisations/actors within the institutional framework)
2. Pasture, livestock and biodiversity (the dynamics of high pasture management, fodder demand and fodder production, quality assessment for land use planning and conservation of soil and vegetation cover).
3. Farm-forestry and natural forest.
4. Assessment (Forest and tree resources assessments, regeneration evaluation, and analysis of the supply and demand of forest products and linkages between farm-forestry practices and natural forest).

5. Farm resources (linkages with “below the channel” resources, which include land, crops and livelihood strategies).
6. Gender, resource management and livelihood security (dynamics of changes in women’s and men’s use, access to and control over resources, and the effects of changes on household food security).
7. Information and documentation (creating a common information resource base relevant to all project sub-themes, facilitating exchange of information between project counterparts in Baltistan and Norway and supporting AKRSP Baltistan’s efforts in networking for information access).

In spite of the practical formulation of sub-themes, the purpose remains to provide an integrated understanding of resource management, reflecting the integrated nature of local ecosystems and livelihood strategies. Integrated analysis is supported by a broad model of natural resource management (Figure 1).

**Figure 1: Conceptual model**



## 2. STUDY AREA: BASHO VALLEY'

### 2.1 SELECTION OF STUDY AREA

As a part of the NRM programme of AKRSP-Baltistan, the cooperation project focuses on Baltistan, the eastern-most region of the Northern Areas. During the NLH-AKRSP Field Planning Workshop in Baltistan in September 1997, the Basho watershed was suggested by AKRSP, and subsequently chosen, as the site for a joint case study. Some factors considered were:

- The presence and importance of alpine resources, including natural forest assumed to be among the largest patches left in Baltistan
- Local people's active interest in the alpine commons, partly expressed through the recent formation of a cluster organisation (the BDO)
- Accessibility (less than two hours driving distance from Skardu)

Basho was selected, therefore, as an interesting and illustrative case for both AKRSP and NLH, given the interest in the high alpine zone. Alpine natural resource management in Basho is probably similar to that of many other watersheds in Northern Areas or Baltistan, but in a strict scientific sense it was not selected to be representative of a certain larger area.

### 2.2 BRIEF DESCRIPTION<sup>1</sup>

The Basho watershed is located about 45 km west of Skardu Town in the District of Skardu, Baltistan. The total area of the watershed is about 120 km<sup>2</sup>. It ascends from the southern

side of river Indus at an altitude of approx. 2,150 m elevation to the Banak La mountain at 5,520 m elevation. The uppermost village of Sultanabad is situated at approx. 3,200 m elevation. It is located within the co-ordinates 75°10' and 75°25' (East) and 35°20' and 35°30' (North).

Situated in the western-most arm of the Himalayan range, Basho is found within a semi-arid and rugged mountain landscape ("mountain desert"). It falls within the "rain shadow" of the Himalayas, and average rainfall in the valley bottom is estimated to be between 100 and 200 mm, but rising with elevation to create a moist environment at the extensive, high-altitude rangelands. Because of the altitude, the area has a marked seasonal climate comparable to that of the temperate zone. The mean maximum temperature during summer revolves between +30 - 35° C, while the mercury is reported to drop to -15° C in winter.

The area falls under three major vegetation types (Schweinfurth, 1957). The lower north-eastern part from the river Indus to about 2,500 m elevation is described as *Sub-tropical semi-desert*. The area above the Sub-tropical semi-desert is classified as *Steppe of Artemisia*, dominated by scrubs such as *Artemisia maritima*, *Eurotia ceratoides* and *Kochia*. The average rainfall may approach 400 - 500 mm, depending on location, and most of the precipitation is received as snow during winter. The vegetation described as *Moist alpine scrub and meadows* borders the *Steppe of Artemisia* at about 3,600 meter. Natural blue pine forest covers the north-western facing moraine slopes above Sultanabad. The forested moraine slopes are led by deep gulches and

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<sup>1</sup> See reports 2, 3 or 4, 1998, for details.

glacifluvial gravel fans sparsely vegetated by pine trees, willow (*Salix sp.*) and shrubs. Grassy slopes and juniper (*Juniper macropoda*) cover areas where the forest has been cut down. Above the pine forest, patches of birch (*Betula utilis*) delineate the upper forest line at about 3,800 meter.

Wildlife known to be found in Basho is Asiatic ibex (*Capra ibex sibirica*), snow leopard (*Panthera uncia*), wolf (*Canis lupus*), red fox (*Vulpus vulpus*), marmot (*Marmota caudata*) and mouse hare (*Ochotona sp.*). Musk deer (*Mochus mochiferus*) is known to be found in the area, but has been highly priced and hunted for its musk. Common birds include chukor partridge (*Alectoris chukar*), jungle crow (*Corvus machrohynchos*) and Himalayan snowcock or ram chukor (*Tetraogallus himalayensis*).

People in Basho live in eight different villages distributed from top to bottom of the zone of permanent habitation along the Khar Nullah: Sultanabad, Nazimabad, Doros, Meito, Guntho, Khar, Bathang and Matillo.

Agriculture and livestock production are the major sources of livelihood; the pastoralist system involves a seasonal transhumance between villages and temporary settlement in the high alpine zone.

Off-farm employment plays an increasing role. Visitors find the natural scenery in Basho attractive; local people are at an early stage of developing trekking and other forms of tourism, and as of 1999 visitors have been coming to Basho from the Shangri-La hotel at Kachura.

The majority of people are *Balti* speakers, while a minority are *Shina* speakers (immigrants from the Astore Valley).

The total number of households in Basho is estimated at 297 and approximate number of inhabitants at 2,400, based on an average household size of eight (Socio-economic survey by Aurang Zeb Zia, AKRSP, 1998).

AKRSP has worked in Basho since 1987. Today, seven of the villages have a Village Organisation (VO) and four or five have a Women's Organisation (WO). A cluster organisation, Basho Development Organisation (BDO) was established in January 1997, but as with the VOs, it grew out of a long-standing tradition of cooperating within the watershed. Villagers refer to a tradition of shared ownership and use of alpine resources.

### **3. MAIN ACTIVITIES AND FINDINGS**

#### **2000**

In 2000, the joint work on applied research and documentation continued. Joint applied research has been chosen as the main mode of competence building. Reporting should therefore not be seen as a matter of presenting “findings” in isolation - but as an indicator also of broader co-operative efforts and processes.

As of 2000, it was possible to follow up activities which were initiated in 1998 and 1999, both in terms of getting the empirical data, in terms of joining perspectives and findings in integrated analysis and of developing competence and skills of all participants. The present reporting should be seen as part of an on-going process towards all of these objectives.

During 2000, six Norwegian researchers visited AKRSP in Baltistan for follow up institutional cooperation and fieldwork initiated in the previous years. In support of the general objectives and in addition to the activities divided under the 6 sub-themes a joint study tour and workshop to Norway was organised for the staff from AKRSP and cooperating institutions.

### **3.1 INSTITUTIONS AND ORGANISATIONS IN PASTURE AND FORESTRY MANAGEMENT**

*Håvard Steinsholt, Mohammad Akbar Raza,  
Poul Wisborg, Hans Sevattal*

#### **3.1.1 Objectives**

In 1998, Prof. Hans Sevattal, Håvard Steinsholt, Poul Wisborg and Mohammad Akbar Raza carried out fieldwork. The main findings and interpretations were presented in Report No. 2 of the seven reports from the project in 1998. In 1999, the work aimed at further exploring in Baltistan the following issues:

- Institutions, management and use of pastures, forestry and tourism under different forms of collective tenure with major focus on alpine region.
- Municipal administration and political systems.
- Village land tenure (in-fields).
- Institutions and systems of ruminant breeding - both large advanced systems (cattle) and small-scale local systems (goats).

In 2000 further explorations in Baltistan was, for different reasons, postponed to 2001. Poul Wisborg made a visit to Pakistan and Skardu, mostly discussing project plans and formal matters (Refer: Travel report from Poul Wisborg). The purposes of Wisborg's visit were mainly:

- Meet AKRSP partners. Reviewing progress, facilitate and discuss further implementation.

- Address a number of practical and economic issues.
- Planning AKRSP visit to Norway August 2000.
- Learning about AKRSPs NRM strategy process in order to be able to draw lessons from project findings.

Most attention in 2000 was directed towards the visit of the counterparts from AKRSP to Norway 12-26 August; giving lectures and participating in discussions during that visit period and especially during the field trip, visiting different representatives from Norwegian husbandry organisations, farmers, tourism organisers, municipalities, State agencies and commons. The aim was to broaden the skills of the collaborating parties through discussions based on knowledge of actual situations - with examples of both successful and problematic institutional arrangements, advanced costly systems and simple ones, systems of Baltistan and of Norway.

#### **3.1.2 Approach**

The AKRSP visit to Norway was comprised of an initial period of lecturing and discussions, followed by field visits in southern and western Norway. The field visits were followed by two days of workshop and winding up. The Baltistan counterpart of "Institutions and organisations", Mohammad Akbar Raza, was not a part of the visiting group, however, organisational and institutional aspects were the focus of many of the discussions. The approval of Ph.D. studies for Jawad Ali has brought a new counterpart into the group. Partly staying at NLH, and focussing on forest

regimes of Baltistan - Ali's presence has vitalised discussions and supervision activity.

Ali and possibilities for extension of the collaboration in the years to come.

### **3.1.3 Main findings**

See 3.7 and the forthcoming report from the field trip by Mohammad Ali.

### **3.1.4 Suggestions for future work**

The component on institutions and organisations addresses issues that deserve further follow-up, particularly:

- The development of rules and practices in alpine pasture management, linked to the evolving focus on range conditions and the productivity of vegetation and livestock.
- The development of rights and responsibilities in forest management, linked to the development of co-management arrangements at watershed or village levels. There are obvious reasons for fruitful collaboration with the Ph.D. project of Jawad Ali. In practical terms, field visit in Basho 2001 will be planned as a joint activity between Jawad Ali and the Norwegian researchers.
- The role of the BDO, perhaps changed by the new framework provided by a conservation and management plan for Basho.
- A closer investigation in Khaplu or other Baltistan area to broaden the scope.

Work of 2001 will be aimed at "closing" the work during the project - making reports, concluding findings and discussions based on the research and collaboration during the project period. Other aims will be to support future collaboration; the Ph.D. works of Jawad

## **3.2 PASTURES, LIVESTOCK AND BIO-DIVERSITY MANAGEMENT**

### **3.2.1 Pastures and livestock**

*Veronika Seim, Mohammed Afzal, Åge A. Nyborg, Øystein Holand, Mohammed Abbas and Mohammed Ali.*

#### **3.2.1.1 Objectives**

Based on recommendations in the Annual Progress Report (Rep. No. 8 1999), the Project Document and Action Plan for 2000 and dialogs between the NLH and the AKRSP team, the main goals for the field season were to:

- Following up the trampling experiments in order to quantify possible effects of trampling on soil physical factors and plant diversity
- Establishing a year round follow up of the “goat experiment” (milk production and body weight measurements)
- Measuring body weight (growth) through the year of sheep and large animals
- Extend the pilot project on nutrient transport from pastures to cultivated fields

In addition a joint project integrating the forestry and livestock component, focusing on the regeneration aspects and the possible effect of livestock grazing was initiated.

#### **3.2.1.2 Approach**

The joint AKRSP-NLH team carried out the fieldwork during the summer months June-September 1999. Ghulam Mohammad was hired as a research assistant taking part in the regeneration project and leading the other livestock activities. From the NLH's side

Snorre Synnestvedt and Jacob Thompson were engaged as research assistants.

#### **3.2.1.3 *Effects of trampling on soil physical factors and plant diversity***

Trampling treatments according to the experimental plan were conducted at 3 weeks intervals (the same as during Summer 1999) within each of the 3 permanent enclosures established at Bondopiri in 1999 (for details of the design and treatments, see Annual Progress Report 1999).

#### **3.2.1.4 *Seasonal fluctuation in milk production and body mass of goats***

The “goat experiment” carried out in 1999 indicated an enormous weight gain potential during the summer period and high priority to restore the body reserves compared to milk production in the local breed of goats. This life history strategy is probably highly adaptive in a highly fluctuating environment.

In July we selected 2 villages (Sultanabad and Doros) and marked about 50 animals. The first weighing was conducted in early July and thereafter with fixed intervals; once a month. Milk production of the marked animals will be recorded, as well as reproductive performance, kid growth and health status of the animals. Also the management regime (especially the winter fodder regime) of the households involved in the monitoring will be recorded. The programme will continue throughout the winter and end in July in order to describe the weight change and milk yield through the year.

### **3.2.1.5 Seasonal body weight changes of sheep and large animals (cattle and cross-breeds)**

We have selected 25 sheep and 25 large animals for monitoring the seasonal body mass fluctuation and animal performance. A scale for weighing large animals has been purchased and brought to Basho and the weighing has started. The programme will also include measurements of milk yield. This will give valuable baseline data of yearly milk production and body weight cycles, and may help us to identify possible production constraints. We expect that the main constraint is the winter fodder situation.

### **3.2.1.6 Nutrient cycling**

The nutrient transport study has been followed up by harvesting the same fields as last year, including plots from 4 owners and 4 different crops (wheat, barley, peas and alfa alfa).

### **3.2.1.7 Current status**

The fieldwork went according to our plan. Much effort has been put into documenting the spatial distribution of pine seedlings and the livestock-grazing pattern and distribution throughout the whole grazing period as part of the regeneration project. The AKRSP team members initiated the weighing programme and have followed up the trampling experiment and the nutrient cycling in an excellent way. An animal census was conducted in the entire Basho valley and data on monthly animal mortality was collected.

### **3.2.1.8 Further work**

In accordance with the discussion during the AKRSP team visit to Norway we suggest the following activities for the final field season:

- Mapping of the winter pasture dynamics and winter pasture rights.
- Gathering information on winter management regime including: winter fodder supply and quality, stall feeding period and feeding practise.
- Complete the monitoring of the seasonal fluctuation in body mass and milk yield of small and large ruminants.
- Following up the trampling experiment; Treatment has to be conducted in summer 2001, vegetation and soil analysis have to be carried out in 2001.
- Complete the nutrient cycle pilot project by completing the soil-sampling schedule, surveying the use and management practise of the manure and the number of animals within each household involved in the project.
- Follow up the livestock depredation survey initiated by Mats Finne.
- Follow up on the animal mortality data collection.

In addition the regeneration study has to be accomplished. The established transects have to be visited regularly in order to monitor the seedling survival and grazing impact, and year round monitoring of the grazing pattern and livestock movement has to be completed. The planned workshops, in Basho, Skardu and Gilgit, will also be an integrated part of the summer 2001 activities. Our aim is to publish the “goat experiment” and the findings related to the summer migration movement pattern this coming spring. In addition we will produce soil and vegetation maps (first version) of Basho and synthesise the variation in biomass production and quality of the fodder resource in time and space for the workshops.

### 3.2.2 Wildlife and Biodiversity

Mats Finne, M. Younus Shehzad, Ghulam Abas, Per Wegge, Mohammad Abbas

This year we have made two different field visits to Basho; one trip for 2 weeks during winter, and one trip for 4 weeks during spring/summer.

#### 3.2.2.1 Main objectives

The wildlife and biodiversity component of the AKRSP/NLH project in Basho has three main objectives:

- a) To collect data on ibex (*Capra ibex siberica*) demographic parameters and population density as a basis for a management plan for an ecologically sustainable harvesting program.
- b) To assess the influence of domestic livestock on the ibex' use of the high pastures.
- c) To collect data on livestock depredation losses and make suggestions on how to reduce such losses.

#### a) Ibex demographic parameters and population density

##### 3.2.2.2 Approach and activities

Ibex surveys were conducted in the valley during winter and summer. The valley was divided into 3 areas (upper, middle and outer valley). These areas were censused simultaneously by 3 different teams. The survey period was 4 consecutive days during winter and 6 days during summer. Counting is more time consuming during summer because the animals use more remote areas at higher altitude compared to the winter season.

Each team consisted of 3-5 persons, mainly people from the local community, but also people from AKRSP, NLH, IUCN, and the government Forest Department. The survey teams spent the whole survey period in the field, staying overnight in tents, caves or shepherd sheds. The survey technique used was partly to stay for longer periods at elevated points, and partly to move slowly through the terrain making short stops to look for animals. The animals were located with the use of binoculars (8-10x) and spotting scopes (40x).

The animals were classified as kids, yearlings, adult females and adult males. In addition males were divided in the age classes 2-4 yr., 5-7 yr., 8-10 yr. and >10 yr., based on horn length, physical characteristics and colour.

Tracks and faecal droppings of other wild animals were recorded if seen.

##### 3.2.2.3 Main findings

###### Winter survey (3. - 7. December 1999)

During the winter survey altogether 62 animals were counted. Seven animals were possibly counted twice, making the probable total number equal to 55 different animals (Table 1). Thirty of the 55 animals were counted in the upper valley, 7 in the mid valley and 18 in the outer valley facing Indus river. One snow leopard was observed in the upper valley and fresh tracks of snow leopard, probably from more than one individual, were seen in the outer valley. Some rutting behaviour was observed, but our general impression was that that main rutting had not yet started.

In the north facing hills, the ground was covered with snow above approximately 3300

m, and in the south facing hills 100-200 m higher. The valley was totally snow covered only in the upper valley. The weather was bright and sunny throughout the survey.

Because of the bright weather, lack of snow and little rutting activity, the animals may have stayed at high altitude and were difficult to spot. The number of animals counted was therefore probably less than the total population in the valley.

Spring/summer survey (8. - 13. June 2000)

During the spring/summer survey altogether 79 animals were counted (Table 2). Most animals were seen by the team surveying the mid valley (40 animals), and the team surveying the outer valley (28 animals). Only 11 animals were spotted in the upper valley. Tracks of snow leopard were spotted 3 places in the upper

valley, and fresh faeces of wolf were collected along the trail in the valley bottom of the upper valley.

Because of little snowfall during winter and a late start of the survey, the conditions were far from optimal for doing a total count of the ibex population. Snow was absent from the south-facing hills, while some snow was still present in the innermost valley above ca 4200 m.a.s.

The area surveyed in the mid valley is mostly south facing. Here some animals are perhaps migrating from the north facing hills on the other side of the mountain because snowmelt is earlier on the south side. The outer valley, where 28 animals were seen is north facing, but according to the local people, the area on the south side of these mountains is seldom used by ibex and regarded as poor ibex habitat.

**Table 1.** Number and group composition of ibex counted in Basho valley during 3. - 7. December 1999.

Group no.	1	2	3	4	5	6	7	8	9	10	11	Tot.	%
<b>Females (&gt;2 yr)</b>	2	2	3	4	1	1	1	3	3		1	21	38.2
<b>Kids (&lt;1 yr)</b>	1		2	2	1	1	2		3	2	1	15	27.3
<b>Yearl. (1-2 yr)</b>				1	2							3	5.5
<b>Males (&gt;2 yr)</b>	3		1	3	1	1		2	3	1		15	27.3
<b>Unidentified</b>	1											1	1.8

<b>Males 2-4 yr</b>	2		1	2	1	1		2	2	1		12	80.0
<b>Males 5-7 yr</b>	1			1					1			3	20.0
<b>Males 8-10 yr</b>													0
<b>Males &gt;10 yr</b>													0

<b>Total</b>	7	2	6	10	5	3	3	5	9	3	2	55	100
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**Table 2.** Numbers and group composition of ibex counted in Basho valley during 8. - 13. June 2000.

Group no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Tot.	%
Females (>2 yr)	3	1	3	4	1	4	1	1		1	1	8	2	2	32	40.5
Kids (<1 yr)	1	1	4	2	2	2		1		1	1	2		1	18	22.8
Yearl. (1-2 yr)	1	1	1		1	1						6		2	13	16.5
Males (>2 yr)	1	1	1	1		3	1		2			5			15	19.0
Unidentified										1					1	1.2

Males 2-4 yr	1	1	1	1		2	1		1			3			11	73.3
Males 5-7 yr						1			1			2			4	26.7
Males 8-10 yr																
Males >10 yr																

<b>Total</b>	6	4	9	7	4	10	2	2	2	3	2	21	2	5	79	
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Even though the ibex were expected to be difficult to observe at this time of year, the area was easily accessible for the observers, and they were able to reach vantage points at high altitude. We think this is the main reason for the increased number of animals observed in this survey compared to the winter survey.

#### **b) Ibex/livestock grazing competition**

##### **3.2.2.4 Approach and activities**

By recording tracks and droppings along transect lines in different parts of the valley, we investigated how variation in grazing pressure and human presence influenced the use of the pastures by ibex. 25 transect lines were walked perpendicular to the contours along the slopes of both sides of the valleys. Along the transect lines, droppings and tracks were recorded at rectangular plots for every 50 m increased altitude. At each site we searched for traces of both small ruminants, large ruminants and ibex within a 100x10 m rectangular plot oriented with the longest side along the contour lines,

covering approximately 0.1 ha. In addition to animal use, we recorded:

- Vegetation cover (0-100 %)
- Phenological state of the vegetation on a scale from 0-4; 0 = no fresh green vegetation (snow just melted), 1 = fresh green plants just appeared, 2 = fresh green grass in most of the area covered by vegetation (no flowering), 3 = the dominant plant species has set flower, 4 = the dominant plant species has set seeds.
- Grazing damages on a scale from 1-3.
- Distance to escape habitat. Escape habitat was defined as larger steep rocky walls, and these areas are mainly inaccessible to the livestock herds. Distance to escape habitat is therefore a parameter that indicates to which degree the ibex has utilised the habitat they share with livestock, or in other words, the conflict zone.

If fresh animal traces were observed along the transect line outside the plots, the trace of small and large ruminants at the highest altitude, and

the trace of ibex at the lowest altitude were noted.

Transect lines were walked from above timberline to where the pasture either met a rock face (escape habitat) or the snowline. Minimum distance between transect lines was 200 m. Altitude of timberline and snowline, and aspect of hillside were noted.

### **3.2.2.5 Main findings**

Totally 148 plots along 25 transects lines were analysed at high pastures in various parts of the valley. Along 22 of the transect lines, fresh ibex tracks (from the spring 2000) were observed. Along 14 of these, we also found tracks of small domestic ruminants. Along 8 transect lines only ibex had been using the pastures so far this spring, except for free grazing large ruminants (e.g. zoo, zoomos, yak).

As a preliminary test, we estimated the longest distance between ibex tracks and escape habitat for each of the 27 transects, irrespective if the tracks were inside or outside the sample plots. The average furthest distance for the group of transects where small ruminants and herders were present (n=14) was 223 meters. The average distance for the group of transects in areas where small ruminants had not yet grazed (n=8) was 196 meters. The difference between the two groups is negligible, indicating no displacement of ibex from the pastures that are grazed by small ruminants in early summer.

Because of a delay, we started to walk the transect too late to notice any altitudinal difference in phenological stage of the vegetation. Plants were mainly in stage 3 (set

flower) at both ends of the transect lines and in different parts of the valley.

### **c) Livestock depredation**

#### **3.2.2.6 Approach and activities**

To collect data on livestock depredation, we engaged 4 trained wildlife guides to visit the sites of livestock killings and gather information on livestock depredation during one year (from June'99 to June'00). They divided the valley into 4 sub areas, and all carcasses were investigated as soon as possible after depredation had taken place. They recorded 1) species/age/sex of depredated animal, 2) species of predator, 3) type of grazing area, 4) if day or night, 5) if predator was killed, 6) owner of depredated animal, 7) if animals were herded, 8) age and sex of herder, 9) date and 10) geographical location.

During the evaluation of the monitoring, it turned out that this work had not been conducted exactly as planned and agreed upon. In the inner and middle valley people had been reporting satisfactory, but in the outer valley facing Indus, no incidents had been reported even though depredation had taken place. As a result only the middle and upper part of the valley had been monitored.

#### **3.2.2.7 Main results**

For the small ruminants, the year can generally be divided into 3 different periods:

1. The period when they are kept inside and stall-fed during mid winter.
2. The period when they are grazing in the villages and the surroundings and brought back to the village in the evening (spring and autumn).

3. The period when they are staying permanently at khlasses during summer.

The cows and zoomos (female, mix of yak and cow) are generally following the same movements. The dry free-ranging animals (dry zoomos, zoos and yaks) stay in the remote areas for a longer period.

During the 2 first periods the monitoring of depredation is convenient. But during the summer period when livestock and people are spread out in the whole valley, it is more difficult to record losses and reveal which predator is responsible for the kills.

About 2/3 of the animals lost due to predation were small ruminants and 1/3 of the animals were large ruminants (Table 3). According to

the reports, wolf is the most important predator of livestock in Basho, being responsible for at least 60 % of the losses.

Secondly the lynx took 25 %, snow leopard 5 %, and unknown predators were responsible for 10 % of the losses. It was somewhat surprising that losses due to snow leopard were rather few. When talking to the villagers we got the impression that snow leopard had been a bigger problem in the outer valley (which was not systematically surveyed). During winter (December-April), no incidences of predation occurred. During the rest of the year incidences of predation were quit evenly distributed, with most animals lost in October (6). Wolves in the vicinity of the uppermost village Sultanabad killed these animals.

**Table 3.** Incidents of livestock depredation in the middle and upper part of Basho valley from June'99 to June'00. (Recorded by Younus Shezad.)

<i>Species</i>	<i>Wolf</i>	<i>Snow leopard</i>	<i>Lynx</i>	<i>Unknown</i>	<b>Total</b>
<i>Small ruminants</i>	10	1	3	1	<b>15</b>
<i>Large rum. adult.</i>	2		1*	1**	<b>4</b>
<i>Large rum. calf</i>			1		<b>1</b>
<b>Total</b>	<b>12</b>	<b>1</b>	<b>5</b>	<b>2</b>	<b>20</b>

\* This cow was probably injured or ill prior to depredation.

\*\*Uncertain if this zoo was predated or died of other causes.

In most cases the observers visited the carcasses and the scenes of predation, but in some cases they only talked to the herders involved. To my knowledge they have been critical to the information received, and double-checked whenever possible.

### 3.2.2.8 Further work

The field work has been completed this year. Further work will be in producing scientific publications, participation in the final workshop and the development of

recommendations for policy and project activities.

## 3.3 FOREST MANAGEMENT

*Heidi Asbjørnsen, Jawad Ali, Knut Velle, Wazir Shabir, Jakob Thompson, Snorre Synnestevedt, Ghulam Mohammed.*

### 3.3.1 Objectives

As a follow up of the research initiated by Knut Velle in 1998 to assess grazing impacts on forest regeneration using fenced exclosures, and the results obtained from a research project conducted by Jakob Thompson and Snorre

Synnestvedt (see Masters thesis by same) in 1999 on seedling abundance and distribution, the following primary objectives were established for the 2000 summer field season for the combined forestry and livestock components of the NLH-AKRSP collaboration project:

- a) Initiate continued research on forest regeneration for improving assessment of seedling distribution and microclimate requirements (including active participation by AKRSP and local assistants in project establishment, data collection, and data analysis);
- b) Evaluate changes in vegetation cover and seedling establishment and growth for the fenced enclosure experiment;
- c) Conduct a survey of farm forestry/agroforestry in Basho Valley to analyse patterns in tree production and use.

In addition, an important component of the 2000 field season was to evaluate project progress and plan the continuation of project activities during the 2000-2001 project year with AKRSP counterpart and staff.

### **3.3.2 Activities and results**

NLH forestry students Jakob Thompson and Snorre Synnestvedt conducted a forest regeneration survey during the second year (1999) as a project for their master studies. The results of this survey indicated that forest regeneration was highly scattered and patchy, and tended to be associated with particular landscape features, such as sheltered areas next to rocks or shrubs, and microsites having more favourable moisture conditions. The study also provided a basis for making recommendations for improving forest management practices

with regard to silvicultural practices and management for forest regeneration. However, the limited data set and constraints in the experimental design precluded the capacity to make more concrete conclusions as to the current state and future potential of forest regeneration in the area.

During the current third year of the project (2000) the regeneration study was expanded with the goal of refining the study design to allow for the collection of a more robust and extensive data set, as well as the establishment of permanent transects for assessing temporal changes in forest regeneration. Further, discussions between the forest management and pastures and livestock components at NLH led to the decision to integrate these activities during the final project phase (years 3-4) in order to better understand interactions between forest regeneration and grazing in the landscape. A survey of farm forestry/agroforestry systems in Basho Valley was also initiated this year to obtain basic information on forestry activities on the farm and their relationship with the use of natural forest resources. The two former masters students, Jakob and Snorre, and a local person, Ghulam Mohammad, were contracted by the project (NLH) as joint research assistants for the forestry and livestock components this field season, while Ghulam Mohammad will continue to work on project activities until next year.

The activities conducted during the 2000 summer field season consisted predominantly of fieldwork in the forest research sites near Sultanabad, where permanent transects were

established and data on forest regeneration and forest structure collected. Three Norwegians participated in these field activities at different times during the field season: Snorre Synnestvedt and Jakob Thompson (field assistants), and Heidi Asbjørnsen (researcher), with a total of approximately 16 months in Pakistan. Several AKRSP members worked together with the research team, including coordinators of the forestry and livestock components, Mr. Jawad and Dr. Afzal, while Shabbir, Dr. Abbas, and Ghulam assisted with organising and implementing the field work, and also helped to coordinate the work with three local field assistants, Younus, Hadi, and Meherban. Several evaluation and planning meetings were held with AKRSP counterparts and staff at different times during the summer field season, as well as two meetings with the Department of Forestry. Four days were spent conducting village interviews on the farm forestry/agroforestry activities.

**a) Forest regeneration and grazing impacts survey**

Transects were established in 4 forest regions in upper Basha Valley (1 in Foriqcho, and 2 each in Goriaq, Durom, and Tanmosa) where the forest regeneration survey was to be conducted. All pine and juniper seedlings within 3 m. of either side of each transect were located and tagged. The following information was recorded for each seedling: exact location with respect to the transect line, seedling height, root collar diameter, foliage height and diameter, and grazing damage. In addition, number and type of animal faeces within a 1.13 m. radius ( $4\text{m}^2$ ) of each seedling was counted

as an indicator of grazing pressure in the vicinity of the seedling.

Once all seedlings had been tagged for all transects, the seedlings were re-visited and the following information collected: age (pines only), microsite conditions (next to or under rock/shrub/stump, aspect, litter depth, humus depth), topography (ridge, ravine, flat, riverbed, plateau), ground cover (1  $\text{m}^2$  grid to assess % grass, shrub, rock, soil, humus, litter, and plant species present). This information on microsite conditions, as well as number of faeces within a 1.13 m. radius, was also determined at every 10 m. point along the transect line in order to estimate the average background conditions in the region. In addition, data was collected on forest structure within a 10 m. radius plot surrounding each seedling, and at every 25 m. along each transect, within which the following information was collected for each tree or stump occurring within the plot: distance from the seedling, species, dbh (tree) or diameter at base (stump), and whether dead or alive; The number of saplings (between 1-2 m in height) occurring within each 10 m. section along the transect line was also determined in order to assess regeneration in the larger size classes; Samples of herb and shrub species present in the transect plots were collected for identification of species (to be determined by Dr. Rubina Rafiq at PARC in Islamabad).

**b) Fenced enclosures – follow-up assessment**

In order to assess the effects of the fenced enclosures (established in 1998) on grazing impacts, the following data was collected for seedlings planted by the Government Forest

Department the seedlings germinating from seed sown by AKRSP/NLH in 1999, and naturally regenerating seedlings: height, root collar diameter, foliage height and width, grazing damage, disease/insect damage, and mortality. In addition, ground cover was determined using a 1m<sup>2</sup> grid method (as described above), for 12 randomly located sites within each plot, and 12 randomly located sites outside each plot (3 on each side of the plot).

### **c) Farm forestry survey**

Approximately 3-4 households were interviewed in each of 4 different villages representing an elevational gradient within Basho valley (Nazimabad, Ghunto, Bathang, and Matilo). Two male team members and two female team members conducted separate interviews for men and women. This survey was not meant to be an in depth and comprehensive research study, but rather, was conducted with the purpose of providing an overview of general patterns of how trees are used by local people, and how uses vary in different altitudinal locations within the Basho watershed. Some general trends observed were:

- Households in the lower villages meet more of their fuel wood needs from farm forestry (40-100%) as compared to households in the upper villages (0-50%).
- Farm forest products are sold both in Skardu markets as well as through a bartering system between villages in Basho valley. Wood products from the lower villages tend to come from farm forestry systems, while in the upper forests they often come from the natural forests.
- Interest in planting trees appears to be steady or in some cases increasing, with

people's preferences tending to favour fruit trees, but with interest in willows, poplars, and other fast-growing species as well. Important limitations to tree planting include the availability of seedlings and having the financial resources to purchase fruit seedlings. Other constraints cited by local people were: lack of water on barren lands, grazing of seedlings by animals, lack of available land, and lack of manure for fertiliser.

- Woody seedlings are generally obtained from cuttings of locally grown trees, while fruit tree seedlings are generally purchased from nurseries in Skardu, as well as a few nurseries located in the lower villages. Establishing more village nurseries may help solve the problem of poor seedling availability or high costs.
- Views on the potential for reducing pressures on the natural forests by increasing farm forestry production varied according to two main perspectives: (1) farm forestry would reduce pressures on natural forests because it requires less work, especially with the distances to natural forests increasing, and the abundance of forest resources decreasing; (2) farm forestry would not necessarily reduce pressures on the forests since farm forest products would probably primarily be sold on the markets to provide an income, while wood for personal consumption would still be collected from the natural forests when possible.
- In general, local villagers expressed concern about the disappearance of the forest resources, citing the increasing hardship of collecting fuel wood from

ever-increasing distances, as well as the possible future lack of timber for constructing new homes. Several villagers wanted to impose a strict ban on the removal of wood by vehicles, for example, through the establishment of a check point.

### **3.3.3 Data analysis and presentation of results**

Analysis of the data on forest regeneration, grazing impacts, and the fenced-in exclosures collected during the 2000 field season is currently in progress. The results will be presented in the final project workshop to be held in Skardu and Basho valley in July/August 2001. As there will be at least three data collection periods between March and October of 2001, the final results and publications of the research will not be available until after the completion of the project.

### **3.3.4 Discussion and recommendations for further work**

This year's field visit was both highly positive and productive for several reasons: 1) the longer time period provided ample opportunity to interact with AKRSP counterparts and staff, and to gain greater knowledge about AKRSP's work and experience in the region; 2) active and extensive participation by NLH researchers together with local counterparts in field work provided useful insights into the ecology and regeneration processes in the forests and allowed for more active involvement in methods development and training, as well as exploring possibilities for increasing integration between the forestry and livestock components; 3) community visits conducted with AKRSP/NLH team at the beginning of the

visit, and later with the farm forestry/agroforestry survey team allowed for greater interaction with local people, enhancing understanding of the relevant issues and problems facing Basho Valley and the relationship of the AKRSP-NLH project within this larger context.

As the data collected for the forest regeneration study during the 2000 field season are currently in the analysis stage, the results and recommendations are not yet available. However, based on the results obtained from the survey of agroforestry/farm forestry systems in Basho Valley, several preliminary recommendations can be presented for future follow-up within AKRSP's agroforestry/farm forestry program:

- Focus on enhancing farm forestry in the upper villages through promoting the establishment of village tree nurseries (including training of local people in seedling production) and testing of both woody and fruit tree species and varieties appropriate for local growing conditions, and continuing to support irrigation channel construction for opening up suitable farm forestry sites.
- Develop community management plans for forest resources that encourages the increased reliance on farm forestry for meeting fuelwood and timber needs, possibly introducing specific incentives for reducing the use of natural forests (e.g., working with those villages that adopt and enforce a management planning approach to develop income generating projects such as tourism or small-scale processing operations).

- Train local village extensionists to provide on-going technical support to villagers interested in working to expand their farm forestry systems, and establish support linkages with the AKRSP team.
- Integrate farm forestry with improved livestock management activities as a means of addressing the relationship between forest regeneration, harvesting of wood products, and grazing.

inside and outside the fenced exclosures to establish a controlled experiment to examine the impacts of grazing on the pine seedlings. The experiment may also be expanded to include larger areas and a greater range of different microsite conditions (i.e., an applied reforestation experiment conducted with active village participation and administration).

***3.3.4.1 Research activities to be conducted during Sept. 2000 – Oct. 2001***

- Collect the following data for each seedling marked along the transects for three different time periods (Sept/Oct 2000, Apr/May 2001, and Sept/Oct 2001): mortality (dead or alive) and cause of death if relevant, new grazing damage, new faeces, drought damage, insect/disease damage, and % canopy cover (the latter only once, in Sept/Oct 2000).
- Livestock grazing pattern survey: conduct observations of the following activities at each of the 4 forest sites: name of herder and herd owner of all animals visiting the site, the number and types of animals in each herd, the type and species of plants grazed (i.e., grass, shrub, tree), and the amount of time spent grazing at the site. Ideally, these observations should be conducted for at least 3 days at each site every week during Sept-Oct 2000 and from May 15-Oct. 31, 2001.
- Potential follow-up of fenced exclosure experiment in the future: Transplant recently germinated pine seedlings from the tree nursery in Sultanabad to sites

### **3.4 FARM RESOURCES**

*Mohammad Akbar Raza, Åge Nyborg, Mukhtar Ahmad, Mohammad Ali.*

#### **3.4.1 Background**

AKRSP and NLH initiated a joint research project on “High Altitude Resource Management in Basho Watershed in the Baltistan region”. Primarily the research focused on seven major components, mainly targeting resources above the channel. At a later stage it was felt that the resources above and below the channel were closely interrelated and greatly influenced each other. In the original project document, major emphasis was only on natural forests, alpine pastures, grazing dynamics and bio-diversity. These two regimes i. e. common property above and below the channel and private property below the channel, are highly integrated and not isolated from one another. When studying the common property resources one has to look at the private farm resources as well. This way a better and more comprehensive understanding of the system is possible. Hence this component was included in the project, led by AKRSP.

#### **3.4.2 Farm Resources**

##### **3.4.2.1 Land**

Compared to other areas, the farmers in Basho have larger land holding. Average land holding is about 10 Kanal (0.5 hectare) in form of terraced fields. Land is not consolidated but in scattered pieces here and there. These may be from one to many in number. (Highest we

could find in one village was seven pieces for 25 Kanals). As a result of Islamic Law of heritage, further land division continues, resulting in further fragmentation. In some cases some family members, who are out for some off-farm jobs, give their land to other family members and in return receive either some cash or kind.

The soils are clearly deficient in nitrogen, Phosphor (P) level is medium, however Potassium (K) is adequate. Farmers are mostly using farmyard manure and also human manure. Chemical fertiliser is also used but in very small quantities. The pH varies from site to site and ranges between as low as 4.7 to 7.0. (7.0 being the optimal value).

##### **3.4.2.2 Water**

Irrigation water is abundantly available in the valley. The source of water is Khar Nullah. Coming from glaciers in the upper valley. The abundance of irrigation water is resulting in unnecessary in-extensive use of water for the crops. No proper irrigation management is being practised. This needs proper attention and some sort of research in irrigation management.

##### **3.4.2.3 Livestock**

According to a recent farm-household income and expenditure survey, livestock plays a vital role in the household incomes in the Northern Areas, Basho is not a different case. All households keep a mixed herd of small and large ruminants. Livestock management and grazing systems were studied in depth during past years. Animal manure is used for the crops for maintaining soil fertility. However, quite large quantities remain in the open grazing

areas, and are not used for on-farm crop production .

#### 3.4.2.4 Farm Forestry

Farm forestry is a relatively new practice in the upper villages. Presence of natural forest was a disincentive for farm forestry. However, the over exploitation of the forest and increasing pressure on this resource has positively influenced the pace of afforestation. Areas under newly constructed irrigation channels are being planted with irrigated forestry plants like poplar and willows. Similarly fruit plants like apricot and mulberry are also planted on slopping grasslands and/or edges of the fields. These plants provide not only fuel wood and timber but also forage for the livestock.

#### 3.4.3 Activities

The main activities during 2000 were:

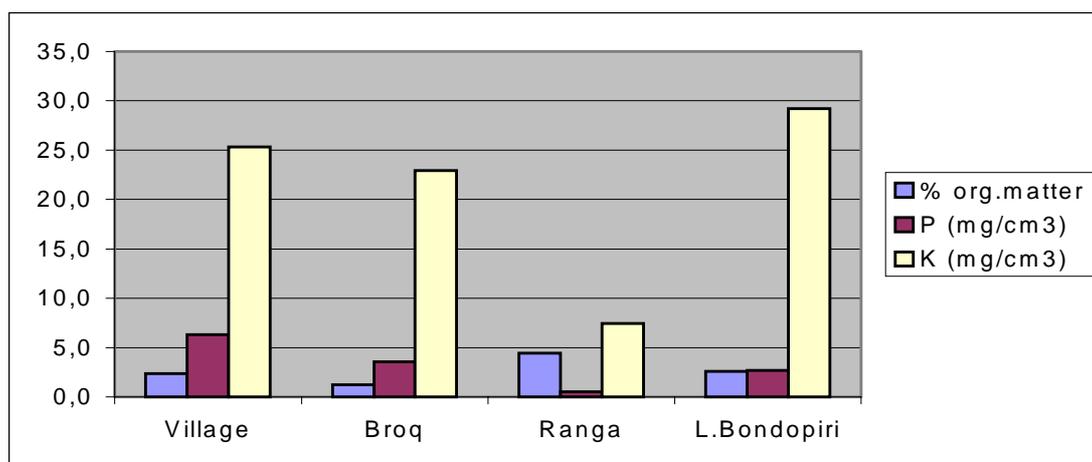
- Some high yielding wheat varieties were introduced on trial basis. These did not perform well. Soil samples were collected from selected fields with improved wheat during the field season in 1999. These

samples were analysed and are being interpreted.

- Soil sampling and testing was carried out at different locations (a selection of households), for ascertaining soil fertility status. The locations included agricultural fields in the village (Sultanabad) and at the *broq* (Rushkin) as well as selected grazing areas.
- Crop harvesting surveys were conducted for looking at yields of various crops.

#### 3.4.4 Major Findings

Land division and fragmentation is a continuous process in the valley. Presently per household average holding is about 10 Kanals. The soils are mostly shallow (meaning rooting depth), very deficient in nitrogen and in many cases also deficient in phosphorus, and have a low organic matter content. The sampled soils at the *broq* (Rushkin) are especially low in nutrients (P and N).



**Figure 1.** Content of organic matter, P and K (mean values) from agricultural soils (village and broq) and adjacent pasture soils (Ranga and Bondopiri)

- Proper irrigation management is not in practice. Excessive use of irrigation water on sandy soils may lead to leaching and loss of plant nutrients to the groundwater. Dense layers in the subsoil may lead to waterlogging and anaerobic conditions. Both sandy soils and waterlogging were observed on the agricultural field in the village.
- Crop yields are very low, due to indigenous varieties and very low external inputs like chemical fertilisers.
- Our understanding of the distribution and availability of animal manure nutrients is incomplete, and needs further investigation. For example, a certain amount of farmyard manure is not being incorporated into on-farm soils. Also, improper storage of the manure may result in volatilisation of nitrogen and reduced fertiliser quality.
- Irrigated forestry program will continue in coming years, under the newly constructed channel.

#### **3.4.5 Proposed activities**

It is suggested that:

- further research is done for improving soil fertility. This may include crop rotation and alternate leguminous crop trials. A survey of the agricultural soils should be carried out to provide basic soil information such as the spatial variability of soil nutrients.
- Participatory cereal variety screening to be continued to find some suitable high yielding varieties, which fit into local cropping system.
- Appropriate research on irrigation management can be an area for future work.

### **3.5 GENDER, RESOURCE MANAGEMENT AND LIVELIHOOD SECURITY**

*Ingrid Nyborg, Kulsoom Farman, Gulcheen Aquil,*

#### **3.5.1 Objectives**

The objectives of this year's work were:

- To follow-up investigations in Basho Valley
- To conduct a comparative study in another valley

#### **3.5.2 Approach**

This component uses a qualitative, social science approach to study the interdisciplinary issues of gender, resource management and food security. A case study approach has been chosen in order to best explore the complicated social networks involved in determining how women and men gain access to and manage their natural resources. The methods include interviews and discussions with village women and men, and key informants both inside and outside the village, the use of participatory learning techniques, and participant observation.

#### **3.5.3 Activities**

Fieldwork: Fieldwork for the comparative study in Basho Valley was conducted in Guntho, one of the middle villages in the Basho Valley, and a case study is currently being finalised based on this data. Another field study was conducted in Satpara Valley, also in Skardu District, and a case study is also being prepared using this data. In addition, a

follow-up field visit was made to Sultanabad to keep updated on changes in the village and valley that have occurred over the last year.

#### **3.5.4 Main Findings**

The case studies in Guntho and Satpara initiated this year have not yet been finalised at the time of this report, but the results will be available for next year's reporting. The field visit to Sultanabad gave further insight into the processes of negotiation over resources in the valley by allowing for the follow-up of on-going conflicts and changes in the valley. In forest management, for example, conflicts continue between the lower and upper valley concerning the rights to timber and firewood in the various forest areas. Until now, the system of monitoring illegal extraction of forest products involved forest volunteers from the local communities reporting misuse to the government forest guard located at the forestry hut in the upper valley. This system, however, was not able to effectively control cutting, as the forest volunteers found it difficult to report illegal activities of their relatives and other powerful members of their own communities. Members of the Basho Development Organisation (BDO) have now agreed upon a new system, whereby teams from the lower valley patrol the upper forests, and *visa versa*, making it more difficult for individuals to negotiate control over resources through social pressure.

Another issue followed-up during this visit was negotiations concerning the formation and functioning of the women's organisation (WO). For the past two years the women and their male allies have been negotiating with

more conservative interests in the community for the very existence of the WO. Having achieved the right to exist, the WO is now having difficulties functioning. WOs have the potential of executing various activities in the areas of infrastructure, health, resource management and education, however, this organisation has been unable to initiate any activity thus far. It seems that the leaders of the WO, two couples<sup>2</sup>, are not able to act on behalf of the women without securing support from the men of the village. For example, the women have been in agreement about the need for piped water to the village<sup>3</sup> for the last year, however the men in the village have been split – some of the men claiming there is no need for piped water, and they should invest in something else (which they did not specify). Those supporting the water project, have in the end, managed to convince the rest of the villagers, and the water supply project, sponsored by WASEP<sup>4</sup>, is in its final stages. Thus, although the WO successfully negotiated its existence, the process of negotiation over resources is far from over, and will likely be a permanent part of the functioning of the WO in the future as well.

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<sup>2</sup> The positions of president and manager of the WO are filled by two couples. This is a usual strategy in Baltistan, in those cases where the women would find it difficult to travel to Skardu on WO business, and represent their interests in other valley for i.e. BDO.

<sup>3</sup> There are several springs in the area which could be piped into Sultanabad to provide drinking water, this is especially important in the winter months.

<sup>4</sup> Aga Khan Water and Sanitation Extension Program

### **3.5.5 Current status**

- AKRSP's research assistant is in the process of finalising two studies (Food Security in Guntho, and a case study of Satpara Valley).
- PhD research is in the process of being written-up as a dissertation. Tentative title: Yours Today, Mine Tomorrow? Women and Men's Negotiations over Resources in Baltistan, Pakistan.

### **3.5.6 Implications/suggestions for further work**

Follow-up in Basho: Continued follow-up in Basho would allow for an analysis of changes over time, both in terms of the physical environment (new channels, an improved road) and the ability of women and men to negotiate over resources. More case studies of other villages down the valley are also recommended, as is a comparative study of villages within the valley.

Comparative studies in other valleys: Upon completion of the case study of Satpara, a comparative study should be written in order to compare the experiences of Satpara and Basho in terms of selected resource management issues. Studies from other areas on related topics relevant for AKRSP, such as poverty alleviation, could also be prepared using experiences from Basho.

### 3.6 INFORMATION AND DOCUMENTATION

Liv Ellingsen, M. Yousuf

#### 3.6.1 Introduction.

Information resource management is central for an international, interdisciplinary research project. AKRSP as an organisation has also felt the need for developing better systems for information resource management and retrieval. Since the start of the HAINRM in 1997 both Noragric and AKRSP has been focusing on this aspect as an integrated part of the collaboration, and results are now being seen at both ends.

#### 3.6.2 Objectives

The main objectives mentioned in the 2000 activity plan were:

- a) To continue ongoing activities in collection and database building.
- b) Reports on the WWW should replace dissemination of paper copies when possible.
- c) To open a more direct link from AKRSP project partners to Noragric's information resources.
- d) To support and encourage AKRSP Baltistan's efforts to establish and run their own library/documentation centre.
- e) The AKRSP Baltistan library will keep up and extend networking for information access.

#### 3.6.3 Main activities and achievements

This sub-chapter is structured according to the objectives mentioned above.

#### *a) To continue ongoing activities in collection and database building.*

##### *Baltistan.*

With project funds, books for about NOK 6000,- have been purchased for the AKRSP library in late 1999-2000. A full set of back issues of the journal "Mountain research and Development" was purchased and reached Skardu in October 2000. Photocopies of various documents as well as full documents printed from the Internet have also been added to the library's resources. Individual team members in Skardu have mainly requested these documents.

In the fall of 1999 registration of documents held by the AKRSP Baltistan library into a ProCite database was begun. In November 2000 this database contained more than 2000 bibliographic records, and according to AKRSP staff this made retrieval of relevant literature for various purposes simpler.

##### *Norway.*

Collection building now mainly takes place when new articles or full documents are published or brought back from the field by project staff. Continuous scanning of databases, news services and e-mail discussion lists takes place and information is being disseminated to project staff in both ends as felt appropriate.

BIBSYS data still cannot be converted to a ProCite format, due to a technical problem with the BIBSYS. BIBSYS has so far not wanted to give priority to correcting this mistake, as may be found natural in a period

with rapid changes to be made to the BIBSYS database system.

BIBSYS data (bibliographic records of full documents of relevance to the HAINRM project held by the Noragric library) have been transferred to the AKRSP Baltistan library in print, whereas ProCite databases have been exchanged between the two libraries.

The total number of HAINRM related documents recorded in BIBSYS under this project is 308 (29.11.2000). The total number of HAINRM related documents recorded in ProCite under this project is 166 (29.11.2000)

The collection of links to relevant sites and documents from the project's WWW pages, must also be seen as an integrated part of collection building. Links to new resources have been added and dead links have been updated or removed on a regular basis. The home page address of the project presentation: <http://www.nlh.no/noragric/Projects/akrsp/>

***b) Reports on the WWW should replace dissemination of paper copies when possible.***

Reports 1-6 have been published in pdf-format. Parts of reports 7-8 are not available in electronic format, and are still not transferred to machine readable files. To increase dissemination the online reports have been reported to the Mountain Forum Online Library, ELDIS Gateway to Development Information and catalogued in BIBSYS.

The log of visits to all files on the site show 1252 visits (excluding visits from the domain nlh.no) to the site in the period January 1<sup>st</sup> –

November 8<sup>th</sup> 2000. Many of the visits are made by search engines, and are as such not very interesting, but there are also interesting visitors and altogether 41 visits were made from computers with domain names .pk – Pakistan.

Further efforts will be made to digitalise the remaining reports and also future documents from the project will be entered to the web site.

***c) To open a more direct link from AKRSP project partners to Noragric's information resources.***

Only one of the project partners in Skardu has been in touch with the Noragric library, through mail and e-mail. Documents, mainly photocopies of journal articles and printed Internet documents have been passed on to her for her own use and inclusion in the AKRSP library collection.

During the AKRSP project team's visit to Norway in August 2000 much effort was put into providing relevant information to each individual's need. This was highly appreciated, but several stressed the limited time for reading and professional development in their day to day activities.

***d) To support and encourage AKRSP Baltistan's efforts to establish and run their own library/documentation centre.***

Since the visit to Skardu by the Noragric librarian in October 1999 there has been regular if not very frequent contact between the libraries.

Support has been given to collection building, as already mentioned. The Noragric project

coordinator visited Skardu in July (Poul Wisborg) and October (Ingrid Nyborg) 2000. On both occasions there were lengthy discussions with the head of the AKRSP library and info/doc. counterpart, Mohammad Yousuf, and head of MER, Stuart Kenword, on the library situation. Most of the recommendations made during Liv Ellingsen's visit in 1999 have been followed up, at least to some extent. Space for the library functions still represents a serious constraint.

Advice has been given on journal subscription management and upgrading to a newer ProCite version, as well as networking for information exchange.

***e) The AKRSP Baltistan library will keep up and extend networking for information access.***

In May 2000 the AKRSP Baltistan library sent a print of its database to the Library of the Degree College and the mosque, with which there was a contact meeting in October 1999. However, both these libraries seem to be in a transitional stage when it comes to staff and no further contact has taken place between the three libraries.

There is close contact with the AKRSP Gilgit library and documents are exchanged between the offices.

Several newsletters from organisations in Pakistan are received on a regular basis, and also some World Bank and ICIMOD documents. However, more systematic work needs to be done on networking, both when it comes to registering for information updates,

newsletters etc., and utilising these resources in a better way.

**3.6.4 Conclusion.**

According to information from AKRSP staff the access to information has improved as a consequence of the increased emphasis on library development at AKRSP Baltistan. A further integration of information activities with AKRSP's professional work is essential for further improvements, and it is hoped that the integration of an information/documentation into the HAINRM project can work as a door opener in this respect.

**3.6.5 Plans for future work**

Mohammad Yousuf, who is in charge of the AKRSP Baltistan library, will spend 2 weeks at Noragric for training in the spring semester of 2001. Liv Ellingsen, Noragric librarian in connection with the summer workshop, will make a return visit. Libraries' contribution to the workshop program will be discussed during Mr. Yousuf's visit to Norway.

Support activities, collection building and database input will continue as needed.

### **3.7 JOINT STUDY TOUR AND WORKSHOP TO NORWAY**

*Mohammad Ali*

#### **3.7.1 Purpose of visit to Norway**

The prime objective of this exchange visit program was to provide the Pakistani counterparts of the NLH/AKRSP Basho research project with an exposure to the Norwegian experience in integrated natural resource management. Norway is a developed country, which for many years has been pursuing a comprehensive strategy on sustainable use of natural resources. On the other hand, Norway and the Northern Areas of Pakistan share several common elements in natural resources. For example both are mountainous areas, both have long, cold winters hence a very short cultivation period; both have very small amounts of cultivable land etc. Second, some 100 years ago, Norway had experienced similar natural resource degradation because of heavy logging of natural forest as Northern Areas are facing today. With time, Norway realised the fatal consequences of the degradation, and took crucial steps for course correction and not only reversed the direction in its own situations but also became one of the leading nations of the world in sustainable natural resource management. It was, therefore, believed that an exposure visit to the Norwegian way of natural resource management would be a lesson worth learning for the Pakistani counter parts of the NLH/AKRSP Basho research work. (A more extensive report of this study tour will be produced in the beginning of 2001).

#### **3.7.2 Approach**

From the Pakistani counterparts (see appendix 2) eight people visited Norway from August 12<sup>th</sup> until August 26<sup>th</sup>. At the Norwegian side nine people participated in different parts of the programme (see appendix 5) which Poul Wisborg and Kathrin Hofmann coordinated.

On returning to Pakistan, the team held a half-day workshop at AKRSP office in Islamabad to consolidate the lessons learned by each individual team member before their disbursement to their places of work. The team was very happy with the overall result of the visit and it unanimously resolved that the visit was well organised, useful, informative and most importantly, lesson learning. The team listed down the following as some of the most important lessons learnt through this exchange visit.

- Norwegian policy on integrated resource management is well integrated- vertically as well as horizontally, whereas the policy for Northern Areas is less integrated. In Norway, there is a systematic co-ordination and co-operation among the different integral bodies of natural resource management, while in the Northern Areas no such coordination system exists.
- In Norway, the farmer co-operatives are very powerful and influential and their voice is heard at the highest levels of the governments while in the Northern Areas, there is no such system in place.
- Norway follows a holistic approach for natural resource management. Norwegian policy encompasses environment, resource

utilisation, nutritional requirements, and demographic shifts from rural to urban, border security and other national and international points of interest. While the issues are more or less the same in the Northern Areas, there is no such policy in place. The Northern Areas administration is in the process of preparing a comprehensive policy for the Northern Areas. It is hoped that this policy will cover at least the most important issues if not all of them.

- The Norwegian land consolidation plan is a highly effective component of NRM. Unfortunately, no such system is in place in Northern Areas. However, the out migration trend from agriculture is increasing in the area. But most migrant people like to keep the piece of land in the village in their own possession. Therefore, it is rented to some relatives or neighbours in the village. But the tenants do not give enough attention to the shared part of the resources and therefore the productivity is seriously suffering. A second reason for this reduced attention is that investments in natural resources are mostly of longer term. Since the tenants have no guarantee that the resources will remain in his hands in the long run, they avoid making any longer term investment. The Norwegian system suits very well for the Northern Areas, and AKRSP can introduce the system in the interested areas. Another interesting aspect of this is that people have emotional attachment with their land. That is why, they do not want to sell their property in the village. A number of people have permanently migrated to

towns but very few sell their land and farm assets in the village. This emotional attachment creates a significant resistance in land consolidation.

- Norwegian research institutes are properly linked with farmers through farmer associations and co-operatives while there are no proper research centres in the Northern Areas.
- Farmer associations and co-operatives provide crucial services to the member farmers.
- There are different farmer's associations and cooperatives serving different purposes. This shows the strength of the co-operative culture and people's confidence in the system. Farming is based on natural resources which are quite vulnerable in nature, while farmers are also quite vulnerable to natural disasters as well as market failures. Therefore they need co-operation instead of competition. Thus the co-operative culture provides adequate support and services to the farming sector. However a strict regular system is required for the promotion of co-operative culture. This is the main reason why a co-operative system could not flourish in Pakistan as expected. One of the mayor achievements of AKRSP in the Northern Areas is the creation of grass root based local institutions to come forward and form associations around common causes. Although the process is slow, AKRSP is rightly allowing the organic growth of the system and provides the necessary back up support.
- The team observed that all NRM policies are framed after proper consultation with

farmer associations. This bottom top approach ensures maximum protection of farmers' interest.

- Like elsewhere, farming is the least profitable profession in Norway. The government provides support to farmers to motivate them to continue farming. The situation in the Northern Areas is different. Here the off-farm income and employment opportunities are limited. There are some seasonal labour work opportunities in towns in the construction sector. But the cost of living in towns is so high that people could not survive on the seasonal income. Therefore most of the farmers take some time for labour work during the less busy season to compensate the revenue gap from farming. There is no government support to farmers. On the other hand, government subsidies on wheat imported from "down country" becomes a disincentive for cereal production in the Northern Areas.
- In Norway, there is an excess of production of livestock products due to breed improvement and introduction of efficient management system. And in forestry, due to large scale afforestation and better management system, introduction of alternative source of energy and electricity, petrol etc. although the climatic and other natural resource conditions are not that favourable in the Northern Areas. The productivity of livestock, farms and forests could be enhanced by introducing appropriate measures suitable to local conditions.
- Globalisation is affecting farming systems in Norway in different ways. For instance,

the government is finding itself in a difficult position over the questions of farmer's support and subsidies.

- Women are increasingly coming to farming sector. Governments provide all support to women as part of its gender equity policy.
- The generous support provided to farmers is a burden on tax payers.
- A large portion of the natural forest is owned by the private sector, but they strictly follow regulations on forest management enforced by the government as well as private associations. In the Northern Areas, most of the forest is owned by the government. People have adverse interest in preserving forest resources, because whatever they extract illegally is their own and all the pressure goes to the government. In the private forest, rules and regulations are not followed properly. Therefore a natural forest is greatly endangered in the Northern Areas. If the government wants to improve the situation, it should take some drastic measures in its policies. In this regard, the role of the communities become quite important and their integration in this process is vital for a successful NRM In the Northern Areas.
- The Norwegian government provides education free of cost until A levels. Education is the key to development. The backwardness in Northern Areas is mainly attributed to poor education.
- The local government system (Kommune) is very powerful and effective in Norway. All the line departments are answerable to the local politicians. This system of

devolution of power seems to work well in Norway. The existing government of Pakistan is trying to introduce the same system in the country. But in a country where the colonial traditions of centralised power is firmly rooted at all sectors and level of governance, it is very difficult to predict the results. Anyhow, it is interesting to see how this devolution agenda would influence the NGO culture in the country and especially in the Northern Areas.

- Visiting a wool processing unit, it was observed that the environment unfriendly parts of the wool process is allowed to conduct overseas; in Scotland UK. Although questions could be raised about the human aspects of this policy, it shows government commitment to provide healthy environment to its citizens.
- The crime rate in Norway is very low. This emphasises the importance of law and order situation in sustainable development.
- The housing system and models are very developed in Norway. Almost all housing materials are local and well adapted to the climatic conditions. In the Northern Areas, people are blindly copying housing models of the plain areas and as a result people need to invest a lot of money in keeping their houses warm and liveable in winters. This is exacerbating already.
- In Norway, tourism is a well-established industry. Government is providing all required support and facilities to the industry. If the Northern Areas government wants to improve and support tourism in the area, it has a lot to learn

from the Norwegian system. Though it would be less possible to duplicate the Norwegian system in the Northern Areas, many measures could be adapted to the local conditions and resources.

#### **4. DEGREE TO WHICH OBJECTIVES HAVE BEEN MET**

This year has been a good year for the project in many ways. With many positive changes taken place in the valley. Representatives of the BDO expressed support for the project and increasing awareness about the issues we are covering. The project is part of a more and more dynamic scene in the valley; there is a new girls' school in Sultanabad with a second teacher; the community guest house is being built with project funds; a new health and mother care centre has been established; road improvement is underway under the new government Poverty Alleviation Programme; There is organisational development in the valley with creation of Village Council in Basho; and a WAPDA hydro-power project is in the exploratory phase, but apparently confirmed.

As research continues in each component; activities contribute to the overall goal of gaining further insights into pasture and forest resources and their role in farmers' livelihood systems.

#### **Planning and conducting research and disseminating and sharing knowledge:**

As joint research is continuing for the third year, results are starting to become available and impacts can be seen. As members of the AKRSP team expressed; they can use experiences and knowledge gained through this project in other fora, for example in workshops with colleagues from other areas. They have also gained knowledge in report writing and through comparative studies with

other areas. From the BDO, local level, AKRSP has received requests for the translation of project reports to Urdu, they have also shown interest to be more directly involved in the planning and implementation of the project.

#### **Training and capacity building:**

We have been planning and conducting research together through which both AKRSP staff and NLH students received in-field training. As described above, there are plans for further training on documentation and soil science (see appendix 4). Another, not directly anticipated result, is team building within AKRSP and between AKRSP and NLH, which this collaboration has contributed to. Capacity building also takes place at local level through participation in research planning and implementation, involving field assistants, research assistance as well as guides and translators.

#### **Exchange of information:**

The library at AKRSP continues to expand and more and more relevant information becomes available to staff and others. AKRSP Baltistan is not yet connected to internet which makes communication more complicated and slow, but this will change in the near future. Online publication will also be directly available from the internet, and the librarian will become familiar with the extensive information possibilities of internet. Networking continues with other AKRSP collaborators such as Agrikarakorum.

**Technical assistance:**

Technical assistance at field level has been given as a constant process by Norwegian researchers during field collaboration. This knowledge will be consolidated in 2001 as more results from the project become available. This will be in the form of brochures, training materials etc.

active participation of village women and men in discussions of the research results, the mainstreaming of gendered findings into the results, and the relating of research results to current and future AKRSP and Northern Areas policy will be important tasks during this process. We eagerly look forward to these challenges as we embark on a new year of AKRSP/NLH collaboration.

**5. CHALLENGES FOR 2001**

In July and August 2001 the final workshop will be conducted. The AKRSP/NLH team is planning a format which is quite different than more conventional workshops where research results are merely presented and discussed. This workshop will involve a longer process (see appendix 3.) whereby preliminary results are first brought to the villagers of Basho for discussion, then to local NGOs, researchers and government officials in Skardu, and finally to a two day workshop in Gilgit where a wider audience of AKRSP staff from other regions, NGOs, researchers and policy makers would be participating.

By designing the workshop process in this way, we will be able to assess the results at ground level with the participation of the local communities who have been involved in the research and are directly affected by its results, as well as influence the policy of both other NGOs and the governmental agencies working in the area.

In anticipation of the workshop, the challenge of making the last field season of this phase as productive and meaningful for all participants as possible remains. Ensuring, for example, the

**APPENDIX 1. Overview of main activities and participants 2000**

<b>TIME</b>	<b>ACTIVITY/OUTPUT</b>	<b>PARTICIPANTS</b>
January- March	<b>Details of project preparation</b>	Staff on both sides
May 17 <sup>th</sup> – June 18 <sup>th</sup> .	<b>Field Research: Pasture, Livestock and Biodiversity</b> <ul style="list-style-type: none"> <li>• Ibex survey</li> <li>• Livestock depredation monitoring</li> </ul>	Mats Finne
October 5 <sup>th</sup> – October 28 <sup>th</sup>	<b>Field Research: Gender, resource management and livelihood security</b> <ul style="list-style-type: none"> <li>• Follow up of the Women Organisation</li> <li>• Follow up on field activities by Gulcheen</li> <li>• Meetings with AKRSP counterparts and staff on workshop for 2001 and the second phase of the project.</li> </ul>	Ingrid Nyborg, Kulsoom Farman, Gulcheen Aqil, Josie Teurlings, Mohammed Ali, Akbar Raza, DR Afzal, Dr. Abbas, Wazir Shabir and Ghulam mohammad
July 2 <sup>nd</sup> – July 17 <sup>th</sup> .	<b>Field Research: Coordination</b> <ul style="list-style-type: none"> <li>• Meet AKRSP partners, reviewing progress, facilitate and discuss further implementation.</li> <li>• Addressed a number of practical and economic issues</li> <li>• Planned AKRSP's visit to Norway</li> <li>• Learned about AKRSPs NRM strategy process</li> </ul>	Poul Wisborg, and AKRSP staff
July 7 <sup>th</sup> – August 5 <sup>th</sup> .  July 12 <sup>th</sup> - August 24 <sup>th</sup> .  May 15 <sup>th</sup> – July 3 <sup>rd</sup> .	<b>Field Research: Farm forestry and natural forest management</b> <ul style="list-style-type: none"> <li>• Forest regeneration survey</li> <li>• Fenced enclosures, follow-up assessment</li> <li>• Farm forestry survey</li> <li>• Meetings with AKRSP counterparts and staff</li> </ul>	Heidi Asbjørnsen, Jakob Thompson and Snorre Synnestvedt
August 12 <sup>th</sup> – August 26 <sup>th</sup> .	<b>Field visits and workshop in Norway</b> <ul style="list-style-type: none"> <li>• Institutional visits in Oslo</li> <li>• Visit to the different departments at NLH</li> <li>• Field visit to high altitude natural resources and local governments: <ul style="list-style-type: none"> <li>• Tourist development</li> <li>• Summer farms</li> <li>• Enterprise development</li> </ul> </li> <li>• Workshop</li> </ul>	Poul Wisborg, Kathrin Hofman, Ingrid Nyborg, Håvard Steinholt, Liv Ellingsen, Øystein Holand, Veronika Seim, Mats Finne, Snorre Synnestvedt, Mohammad Ali, Jawad Ali, Mohammad Afzal, Wazir Ghulam Haider, Mohammad Abbas, Wazir Shabbir Hussain, Mohammad Sharif and Mohammad Younus.
Throughout the year	<b>Information and documentation</b> Collection of literature; expanding databases, institutional network references.	Liv Ellingsen and Mohammad Yousuf
Throughout the year	<b>Coordination</b> field visit, planning of the workshop in Norway	Poul Wisborg
November – December	<b>Preparation of annual progress report and plans for 2001</b>	All staff

**APPENDIX 2. Overview of NLH visitors to AKRSP Baltistan and AKRSP visitors to Norway**

<b>Project</b>	<b>NLH - visitors</b>	<b>Time (gross travel)</b>	<b>Comments</b>
Institutions and organisations/ Coordination	Poul Wisborg	02.07. – 17.07.	Coordinator/Researcher
	Josie Teurlings	05.10. – 28.10.	Administrative assistant
Pasture, livestock and biodiversity	Mats Finne	17.05. – 18.06.	Researcher (wildlife)
Farm forestry and natural forest assessment	Snorre J. Synnøstvedt	15.05. – 03.07.	MSc student, NLH
	Jakob Thompson	12.07. – 24.08.	MSc student, NLH
	Heidi Asbjørnsen	07.08 – 05.08.	Researcher/supervisor
Gender, resource management and livelihood security	Ingrid Nyborg	05.10. – 28.10.	PhD Researcher
<b>Project</b>	<b>NLH - visitors</b>	<b>Time (gross travel)</b>	<b>Comments</b>
Regional Programme manager, AKRSP	Mohammad Ali	12.08 – 26.08.	Regional Programme manager
Pasture, livestock and biodiversity	Mohammad Afzal	12.08. – 26.08.	Livestock manager
	Mohammad Abbas	12.08 – 26.08.	Veterinarian
Farm forestry and natural forest assessment	Jawad Ali	12.08 - 26.08	Forester
	Wazir Shabir Hussain	12.08 – 26.08	Forester
	Wazir Ghulam Haider	12.08. – 26.08.	Field management unit
	Mohammad Sharif	12.08. – 26.08.	Divisional forest officer Skardu
	Mohammad Younus	12.08 – 26.08.	General Secretary Basha Development Organisation

### **APPENDIX 3. Preliminary programme for the final workshop July / August 2001**

The AKRSP – NLH collaboration will be entering its fifth and last year of its first phase in 2001. In 2001 a final workshop will be held to disseminate the results of this research collaboration in the broadest way possible. To ensure that the findings will be accessible and applicable at all levels, a participatory approach will be emphasised. For this purpose the workshop will consist of four parts.

Part one	
Date	ca. July 26 and 27
Place	Skardu
Participants	AKRSP and NLH team
Purpose	Presentation and discussion of the findings of the research carried out within the different components during this first phase. Planning for the presentation and discussion in Basho Valley
Output	Simple messages to be brought to the field Discussion of scientific reports.

Part two	
Date	ca. July 29 - August 1
Place	Basho Valley
Participants	AKRSP and NLH team and local community involved in the project.
Purpose	Presentation and discussion on the findings of the research for and with the local community. Assessment of the research process in the valley.
Output	During this workshop information on how to use the research findings in the community will be developed and made available in the form of leaflets understandable for the target group.

Part three	
Date	August 3 and 4
Place	Skardu
Participants	AKRSP and NLH team and representatives of the local community, local NGOs, researchers and governmental officials in Skardu.
Purpose	Sharing and discussing findings and experiences with other actors involved on similar topics. Planning for the Gilgit workshop.
Output	Ideas for possible new collaboration, and policy recommendations

Part four	
Date	6-7 August 2001
Place	Gilgit
Participants	AKRSP and NLH counterparts, representatives of the local community, AKRSP staff from other regions, local NGOs and researchers, policy makers, IUCN, Norwegian Embassy, and others
Purpose	Discussions on the findings with all actors involved: Local community, researchers and policy-makers.
Output	Policy and research recommendations

#### **APPENDIX 4. Training in soil science for AKRSP staff.**

##### **Introduction:**

The soil is one of the most important natural resources on the planet. It serves as medium for production of plant and animal biomass, it is the purification medium of groundwater and atmosphere against pollution, the main base for food production and, it is in itself a reservoir of biomass larger and more diverse than the biomass we can see on the earth's surface. It is in the best interest of people that this resource is managed in a way that takes the advantage of its potentials without causing soil degradation of any kind. It is therefore important that soils are taken into consideration when natural resource management issues are discussed and studied, and that information about the soils is made a natural part of any natural resource inventory.

**Objective:** To make AKRSP-B able to carry out simple soil investigations by giving a AKRSP-B staff member training in practical pedology. The program will emphasise hands-on training together with NIJOS staff in connection with ongoing projects involving collecting, managing and using soil information.

Specifically, the trainee after training will be able to carry out studies regarding soil quality in Baltistan region in connection with, for example,

- a Soil degradation due to: continuous monocropping practices (agricultural and forestry crops) i.e. soil contamination, soil-borne diseases, and nutrient loss (erosion and soil mining); and grazing practices (soil compaction).
- b Nutrient cycling in animal/crop systems
- c Soil-water management i.e. waterlogging, erosion

**Requirements:** MS degree in agronomy, plant science or soil science (preferably integrated studies). Good English language and computer skills.

##### **Proposed content:**

- a Basic soil genesis, morphology and classification (theoretical introduction).
  - factors and processes of soil formation
  - soils related to geology and landscape
  - soils related to land cover (vegetation) and land use
  - soil morphological characteristics (colour, structure, texture, organic matter content etc.)
  - classifying soils
- b Soil description and sampling in the field.
  - description of soil profiles and profile sites
  - soil sampling methods
- c Soil Mapping.
  - mapping methods
  - stereo image interpretation
  - planning and administrating a soil mapping project
- d Analytical soil data.
  - chemical and physical soil analyses
  - interpreting and managing laboratory data
- e Storing and presenting soil information.
  - correlating and classifying field data
  - soil database management
  - presentation of soil information (tables, statistics, maps etc.)
- f Using soil information.
  - soil data in risk assessments (soil erosion, compaction, groundwater pollution etc.)

- soil data in suitability assessments (agriculture or other land uses)
- soil data in land quality assessments/improvements (pasture quality, natural reforestation, irrigation/drainage of agricultural land etc.)

The theoretical part of the training can be carried out as literature studies, discussions and exercises at NIJOS and at the dept. of soil science, NLH. Field training will be done in connection with regular soil mapping field work (NIJOS). Additional field training can be planned in connection with field work in Basho, 2001.

**Duration:**

Theoretical part: 5 weeks before field season (February-March).

Field training: 1 week in Norway (March) + 2 weeks in Basho (July).

It is suggested that the trainees arrive in mid-February with the AKRSP-planning team, and continue in Norway for the duration of the course. Fieldwork in Norway is planned for the last week in March, when the ground has thawed.

## **APPENDIX 5. Programme for the study tour/ workshop in Norway .**

High Altitude Integrated Natural Resource Management: Institutional cooperation between the Agricultural University of Norway (NLH) and the Aga Khan Rural Support Programme (AKRSP), Pakistan.

A programme implemented in cooperation with the Basho Development Organisation, Northern Areas Forest, Parks and Wildlife Department, the World Conservation Union (IUCN) and other local institutions.

Norwegian experiences. Study tour 12 August to 26 August 2000

Participants from Northern Areas, Pakistan

- 1: Mohammad Ali, Regional Programme Manager, AKRSP
- 2: Jawad Ali, Manager Forestry, AKRSP/PhD fellow NLH
- 3: Mohammad Afzal, Manager Livestock, AKRSP
- 4: Wazir Ghulam Haider, Field Management Unit, Skardu, AKRSP
- 5: Mohammad Abbas, Veterinarian, AKRSP
- 6: Wazir Shabir Hussain, Forester, AKRSP
- 7: Mohammad Sharif, Divisional Forest Officer, Skardu, Forest Department
- 8: Mohammad Younus, General Secretary, Basho Development Organisation

Participants from the Agricultural University of Norway (in parts of the programme)

Ingrid Nyborg, Noragric, Researcher  
Håvard Steinsholt, Associate Professor, Dept. of Landscape Planning  
Liv Ellingsen, Librarian, Noragric  
Øystein Holand, Associate Professor, Department of Animal Science  
Veronika Seim, Researcher/Project Leader  
Mats Finne, Researcher, Dept. of Biology and Nature Conservation  
Snorre Synnestvedt, Research Assistant, Department of Forestry Sciences

Coordinators:

Poul Wisborg, Project Coordinator, Noragric. Tel: 64 94 98 09. Fax: 64 94 07 60. E-post: poul.wisborg@noragric.nlh.no  
Kathrin Hofmann, Environmental Advisor, Rauma Municipality. Tel: 71 22 19 19. E-post: handlage@hotmail.com

### **High Altitude Integrated Natural Resource Management**

Norwegian experiences. Study tour 12 August to 26 August 2000

DAY	Place	Time	Activity
Fri 11	Dubai – Amsterdam – Oslo	18.20 19.30 20.00	Arrival Oslo Airport Gardermoen with KL 1147 from Amsterdam. Pick-up by NLH (Ingrid and Åge Nyborg) Arrival Anker Hotel, Storgt. 55, Oslo Dinner
Sat 12	Oslo - Ås	Morning  Afternoon	A stroll and shopping in Oslo with Snorre Synnestevedt Departure for Ås by train Arrival Ås Station. Received by Poul Wisborg Getting installed at the University Hostel, Kajaveien 18 Programme and practical info Walk around campus and in "Ås downtown" Dinner at Ås Hotel
Sun 13	Ås	10.00 – 13.00  16.00 19.00	Introduction to Ås and surroundings. Håvard Steinsholt - General information about Ås Kommune (Municipality) - Local fieldtrip including farm visit Lunch on the way or in Kaiaveien Hostel Tea/cake/coffee at Ingrid's and Åge's home (Liavn. 11B, Ås) Dinner at Buggen Pizza (optional)
Mon 14	Ås	08.15 – 09.30 10.00 12.00 13.00 - 15.30  16.00 17.30 20.30 –21.30	Welcome and introduction: Yellow Room, Economy Building, NLH Library and documentation. Information search and requests Lunch at the Economy Building (Red Room) Background info to Norway by Animal Science Department. Livestock. Summer farming. Wildlife. Odd Vangen, Head of Department, Veronika Seim, Researcher; Øystein Holand, Associate Professor, Lars Olav Eik, Associate professor. Visit to summer farm shed/reindeer pen. Shopping in Ås (if required) Barbecue at Veronika's place in Ås (Brekkekroken 12) Herlaug-spelet – outdoor dance theatre performance, Holstad Gård, Ås
Tue 15	Oslo	07.34  08.30 - 10.30  11.00 – 13.30  14.00 -16.00  16.00 18.30 20.00	Train Ås – Oslo Institutional visits, Oslo Ministry of Agriculture, Cecilie Asp, Senior Executive Officer, Section for agricultural agreements and Geir Dalholt, Director, Section for enterprise development Walk in down-town Oslo, including visit to Akershus Festning (fortress) and lunch "Norges Bondelag" (Norwegian Farmers' Association), Steinar Seljegard, Secretary International Affairs and Bjørnulf Kristiansen, Special Advisor Sight-seeing Oslo: Vigelandsparken, Holmenkollen Dinner in Oslo (optional) Evening out in Oslo (optional). Return to Ås by train (at preferred time)
Wed 16	Ås	09.00  12.00 13.00 – 15.00  18.00	Background info to Norway: Department of Landscape Planning. Land use. Property rights. Forest. Lunch at Sørhellinga canteen Norwegian Institute of Land Inventory: forest inventory and vegetation mapping in Norway. Åge Nyborg, Researcher; Harald Olde, Project Leader, Forest taxation and monitoring Dinner with Øystein Holand and family (Hellinga 14C)

*Programme cont.*

Field trip Thursday 17 August to Wednesday 23 August: Ås – Stange - Lillehammer – Heidal – Lom – Geiranger – Herdalseter – Rauma – Bjorli – Ås

DAY	Place	Time	Activity
Thu 17	Ås – Stange - Lillehammer – Gudbrands- dal - Heidal	07.30 09.30 – 11.30 13.00 – 15.00  15.30	FIELD TRIP TO CENTRAL NORWAY Departure from Ås ”Store Ree Avlstasjon” (animal breeding station, cattle) ”Statsskog”, Lillehammer – Forestry in Norway and the region. Policy and administration. Departure for Heidalen Stay and dinner at Nordre Ekre Gard, including “farm museum”, tel: 612 34 113
Fri 18	Heidal - Lom	07.00 08.00 10.00  Afternoon  Evening:	Into the mountains cultural and land use history. Reindeer herding and conservation. Breakfast at Nordre Ekre Gard Drive through Heidal – Randsverk – Lemonsjøen - Lom. Lom Mountain Museum Lunch Lom Reindeer Company, Gaute Helland, Veterinarian Jotunheimen National Park, Espen Bø Lom stave church. Stay at Fossheim Hotell, Lom (61 21 10 05). Dinner at Arne Brimi’s restaurant, Fossheim Hotell
Sat 19	Lom - Strynefjellet - Geiranger - Nordal- Herdal	07.00 08.00 10.00 11.30 12.30 15.30 approx.	Tourism development, Strynefjellet. Attractions of the fjord landscape: Geiranger. Alpine summer farming Breakfast Departure from Lom. Drive via Strynefjellet to Stryn Summer Skiing Centre on the Tystig-glacier (57 87 40 40) Departure Geiranger. Picnic lunch somewhere along the road Herdal Summer Farm (perhaps Norway’s largest goat “felleseter” (co-managed summer farm). Åshild Dale and Jostein Sande (Tel: 70 25 91 08/94 77 53 57). Orientation. Milking and milk storage. Dinner and stay at Herdal Summer Farm
Sun 20	Herdal - Trollstigen - Rauma	08.30 10.00 11.30 15.00	Tourism development and landscape protection Breakfast at Herlaug summer farm Drive via Valldal – Meierdalen Walk to Bispevannet Down Trollstigen to Åndalsnes Settling at Istedalen: Stay in Istedalen, cottages (Trollstigen Hytteutleie, Tel: 71 22 68 99)

Mon 21	Rauma and Isfjorden	08.00 09.00 – 10.30  11.00 12.00  15.00 16.00 17.30 Evening	Local government and challenges/conflicts in agriculture – environment - tourism Breakfast Rauma Kommune (municipality) - Gerd Dale, “Manager Agriculture” – agriculture in the north-western region of Norway - Rune Horvli, “Manager Forestry” – forestry in the north-western region of Norway - Solveig Brøste Sletta, Project Leader. Farmers tourists and conservation in Reinheimen National Park and “southern core area for wolverine Lunch at the Town Hall Canteen Agriculture in Isfjorden: farm Visit to “Moa” dairy farm and farm saw mill (Bjørn Morstøl and Knut Edvart Grøtta) Forest management: planting and harvesting. Rune Horvli Wood processing/ski making: Local craftsman, Thomas Aslaksby Dinner: Isfjorden kro or Bondekvinnelaget (Women farmers association) Trip to Littlefjellet, Vengesdalen /concert in local church or visit to Grøtta art gallery, Isfjorden Return to Isterdalen
Tue 22	Rauma – Brøstdalen – Ulvådalen – Bjorli	08.00 09.00 – 11.00 11.00 – 12.00 12.00 – 13.00 14.00 – 17.00	Agrobased enterprise development and livestock herding Breakfast, Isterdalen Wool processing factory, “Rauma Ullvarefabrikk”, by Magnhild Tallerås. Travel Åndalsnes – Brøstdalen Summer dairy farming and milk processing, Kabben Seter, Marit Kvam Picnic, if the weather allows Ulvådalen. Project on guarding/ herding with dogs in core wolverine area. Walk to sheep herders’ hut to visit herdsman Harry Kay Amundlien. Travel to Bjorli. Stay at Bjorliheimen Hotell (61 24 55 61)
Wed 23	Bjorli - Ås	08.00 09.00  12.00	Tradition, crafts and enterprise development Breakfast Bjorliheimen Hotell “Bjorli Laftebygg”. Jostein Espelund/Jan Erik Lehre traditional house construction Jan Erik Lehre: enterprise development: skiing, tourism  Drive from Bjorli via Lillehammer to Ås (six hours) Stay at Kaiaveien Hostel

BACK AT THE UNIVERSITY

Thu 24	Ås	08.15 – 16.00	Team work: analysis, workshop preparation and project planning
Fri 25	Ås	09.00 – 11.30  Afternoon 14.30 Evening	Open workshop at NLH Place: The Norwegian Museum of Agriculture Individual networking and wind-up meeting Friday Coffee at Noragric Farewell barbecue
Sat 26	Morning		Shopping at Ski (if desired) Preparing for departure

**Words:**

Bre	Glacier
Dal	Valley
Fjell(et)	(The) mountain
Fjord	Inlet of the sea (normally, sometimes used about freshwater)
Jotunheimen	"Home of the giants" (in Norse mythology), Norway's perhaps most famous mountain area, including the highest peak, Galdhøpiggen (2,469 m)
Kommune	Municipality, local government
Rein	Reindeer
Reinheimen	"Home of the reindeer", mountain area south of Romsdalen
Seter	Summer farm, broq
Skog	Forest
Sjø(en)	(The) lake