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**Kyrgyz Republic**

**Mountain Rangeland and Forest Sector Note**

**A Study by**

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## CURRENCY EQUIVALENTS

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## ABBREVIATIONS AND ACRONYMS

ASSP	-	Agricultural Support Services Project (IDA)
ADB	-	Asian Development Bank
CFMP	-	Collaborative Forest Management Program
CIS	-	Commonwealth of Independent States
CAS	-	Country Assistance Strategy
DoF	-	Department of Forestry
ERR	-	Economic Rate of Return
FRR	-	Financial Rate of Return
GDP	-	Gross Domestic Product
GNP	-	Gross National Product
GYPROZEM	-	Pasture Monitoring and Protection Unit, Kyrgyz Land Management Institute
HA	-	Hectare
IDA	-	International Development Association
IMF	-	International Monetary Fund
INSPR	-	Interim National Strategy for Poverty Reduction
IPGRI	-	International Plant Genetic Resources Institute
KAFC	-	Kyrgyz Agricultural Finance Corporation
KGS	-	Kyrgyz som
KIRFOR	-	Kyrgyz-Swiss Forestry Support Program
Leshoz	-	Forest farm
NTFP	-	Non-Timber Forest Products
RADS	-	Rural Advisory and Development Service
SFA	-	State Forest Agency
UNDP	-	United Nations Development Program
UNV	-	United Nations Volunteers
VAT	-	Value Added Tax
WB	-	World Bank

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## EXECUTIVE SUMMARY

### *Background and Objectives*

i. The Kyrgyz Republic is a small, mountainous country with a predominantly agricultural economy. Land area is about 200,000 km<sup>2</sup>, over 90 percent of which is at elevations above 1,000 meters. The Republic includes the upper watersheds of the Aral Sea Basin. Management of these watersheds influences downstream water flows. Arable land comprises only 7 percent of land area, compared with over 50 percent for range and forest land. The livestock sub-sector accounts for approximately one-half of agricultural GDP. The Kyrgyz Republic has 4.5 million people, of whom 60 percent live in rural areas. Per capita GDP is US\$380, and poverty is widespread. Poverty levels are higher in rural than in urban areas, and are particularly high among people living in mountainous areas, where they are dependent on natural resources for their livelihoods. Comprising 20 percent of the population, 90 percent are characterized as poor, compared with 55 percent for the population as a whole. Improved natural resource management thus has a key role to play in poverty reduction in mountainous areas.

ii. The objective of this review is to identify opportunities for improved pasture and forest management to contribute both to poverty reduction and increased living standards, and to improve management and protection of upper watersheds. The review has been undertaken within the context of the Interim National Strategy for Poverty Reduction (INSPR) process, and addresses three objectives of the Country Assistance Strategy: poverty reduction; sustained growth through removal of impediments to private sector activity; and improved governance. The review was designed to provide recommendations that could be implemented through existing natural resources management projects such as the Central Asia Transboundary Biodiversity project (World Bank/GEF), the Sheep Development Project (IDA), and the Agricultural Support Services Project (IDA). The audience for this review is stakeholders in the Kyrgyz Republic engaged in poverty reduction and natural resources management, including decision makers, line ministries, technical professionals, and non-governmental organizations.

iii. The review is the outcome of field visits in Kyrgyz Republic and a stakeholder workshop at which initial constraints and options were discussed. It builds on experience with rural development and natural resource management programs supported by the Kyrgyz authorities, as well as the Bank and other donors, over the last five years. Its findings and recommendations were considered in the preparation of the Interim NSPR, and will serve as inputs to the upcoming Country Assistance Strategy Update and the full NSPR.

### *Issues in Pasture and Forest Management*

iv. Kyrgyz range and pasture lands total 91,000 km<sup>2</sup>. They can be grouped for management purposes into three zones: summer pastures (44 percent) at elevations

above 2,500 meters; spring and fall pastures (30 percent) at mid elevations; and winter pastures below 1,500 meters (26 percent). Before 1990 these pastures were managed in an integrated way, with large-scale seasonal transport of animals between summer and winter pastures. Since independence this system has broken down, following rising transport costs, a collapse in regional markets for wool, lack of capital for winter feed, and privatization of the state-owned flocks. As rural incomes have collapsed, land previously planted with fodder is used as arable land for subsistence purposes. Animal numbers are only 40 percent of previous levels, though the numbers are beginning to recover.

v. Despite this collapse in numbers, problems of pasture degradation persist. Pastures near settlements are over-grazed, while vegetation has been slow to recover in denuded upper pastures, which are vulnerable to landslides. Fodder yields are well below potential. Social and institutional issues contribute to the problem. Livestock owners have little experience with commercial stock management practices, and there is insufficient cultivation of winter feed. Advisory services, with some exceptions, have not met the specific needs of mountain farmers, and there is little recent experience with informal associations. Land ownership and financial structures do not provide incentives for good management. Rangelands are owned by the State but administered by Oblast or local governments; they are generally leased on an annual basis, and user fees are collected by the local and regional government, the majority of which is used for local expenditures (schools, roads, etc.). There is thus an incentive to maximize revenue, potentially through overstocking pastures. Pastures are monitored by the Pasture Monitoring and Protection Unit of the Kyrgyz Land Management Institute, financed by the State Budget but under-funded.

vi. Forest land comprises only 0.85 million ha, or 4 percent of the land area. Forests play a key watershed protection role, however, and include globally significant ecosystems including wild relatives of key fruit trees such as walnut, pistachio and apple. Forests are state-owned, and are managed at central and regional level by the Department of Forestry, with management and production at district level administered by financially autonomous leshozes (forest districts). Most forests are classified as “protection forests” but funding is insufficient for conservation management to be undertaken effectively.

vii. Maintenance of vegetative cover (pasture or forest) in the upper watershed of the Aral Sea basin helps to reduce and even out runoff, decrease the severity of floods, reduce silt levels in rivers and reduce the cost of maintenance of downstream irrigation infrastructure. Sound management of pastures and forests therefore has a spatial and a cross-sectoral dimension.

viii. An additional key constraint, which is common to public sector management in the Kyrgyz Republic, is the low salaries, declining morale, and the eroding skill base of the government agencies responsible for pasture and forest management at the local level. The public sector will continue to play a role in these areas because of their "public good" elements; but until the economy recovers the focus will need to be on community-based

approaches to natural resource management, in addition to strengthening and redefining the role of public institutions.

***Priorities for Improved Pasture Management.***

ix. The key challenge for improved pasture management is improved access of people to rangeland resources. The highest priorities for improved management include:

- ③ Promote long term leases of pasture land, by individuals and associations; introduce provisions for sub-leasing, and ensure transparency of the leasing process and the rights of private investors;
- ③ Expand the technical and organizational innovations being piloted under the IDA/IFAD-financed Sheep Development project. These include introduction of improved species composition for rangeland, the use of GIS-based information systems for monitoring pasture conditions; protection of vulnerable rangelands through community based approaches to pasture rotation, weed control, grass sowing, increased production of winter fodder, and improved animal husbandry;
- ③ Increase credit funds and animal health and advisory services available in mountain regions, especially for livestock production and utilization, and provide incentives to villagers such as easier credit and leasing arrangements for groups;
- ③ Support participatory natural resource management, whereby local communities undertake a range of technical improvements in livestock, arable land management, forestry, and soil conservation, improving both incomes and sustainable watershed management; and

***Priorities for Improved Forest Management.***

x. The key challenges in forest management are to improve the contribution of sustainable forestry to rural livelihoods and expand the role of forests in watershed protection. The highest priorities are::

- ③ Expand the reform of leshoz administrations based on the pilots that provide leshozes with greater autonomy and financial incentives to improve forest management under the Kyrgyz-Swiss Forestry Support Program;
- ③ Expand community based forest management approaches that improve access to forest resources, such as the Collaborative Forest Management Program, and
- ③ Improve landscape management to encourage potential for adventure tourism, sustainable hunting, fishing and wildlife viewing, and build on the present system of protected areas and ecosystems conservation supported by the ongoing GEF Central Asia Transboundary Biodiversity project; and

*Conclusion*

xi. There are constraints to improved pasture and forest management in Kyrgyz Republic, but they are common to those faced in other countries with large numbers of rural poor dependent on mountain ecosystems. Participatory approaches to natural resource management can simultaneously increase incomes and reverse natural resource degradation, and have been successfully undertaken by poor rural communities with technical and financial support in North-western China, Turkey and Albania. Such programs also contribute to broader watershed protection. If well managed, Kyrgyz Republic's pasture and forest resources can contribute substantially more to economic growth and rural incomes than they do at present.

## I. INTRODUCTION

1.1 The Kyrgyz Republic is a small, mountainous country with a predominantly agricultural economy. The Republic covers 198,500 km<sup>2</sup>, over 90 percent of which lies at elevations above 1,000 m elevation. The population is approximately 4.5 million people (1997), 2.7 million of which live in rural areas. The mountain resources of the Kyrgyz Republic are of global, economic, and cultural importance. The conservation and sustainable use of its mountain ecosystems are important for Kyrgyz economy and culture, as a vital part of traditional land use practices, a source of income, natural foods, and medicines for local communities and national economy, genetic resources; and as a source of water for other Central Asian countries.

1.2 Agriculture accounts for 41 percent of the Kyrgyz GDP, and one-half of agricultural economy is from the livestock subsector, predominantly from sheep. Livestock populations in 1999 are estimated at 4.7 million animals: 3.3 million sheep, 543,000 million goats, 511,000 cattle, 350,000 horses, and 17,000 yaks. An estimated 1.2 million people live in or near the forests and adjacent communities, and 150,000 people live within the forests. According to official statistics, the direct economic contribution made by the forest sector is only 0.1 percent of GDP. However, forests and forest management have a major role in protecting the watersheds and biodiversity resources in the fragile mountain areas. Restoration of degraded mountain environments is a major challenge for the sector.

1.3 During the Soviet era, a technically competent, highly intensive regional (now international) system of livestock and pasture management was in use, which managed the seasonal movements of more than 9 million sheep and goats between the mountain summer and winter lowland pastures in Kyrgyz Republic and in neighboring Kazakhstan and Uzbekistan. At the time of independence, the Kyrgyz Republic had a relatively well-yielding livestock industry. This industry was based on a combination of Soviet inputs and traditional skills, making use of natural pastures supplemented by cultivated fodder. After independence in 1991, livestock numbers dropped sharply as a result of the suspension of price controls and subsidized feed imports, and the collapse of intra Soviet Union trade arrangements. Despite the decline in livestock numbers, the problem of overgrazing persisted but at a different level. There is overutilization of the more accessible pastures, while those furthest from settlements are undergrazed. A large part of the pasture resource is in poor condition, with low productivity, topsoil erosion, and occasional mudflows in highly degraded areas.

1.4 With regard to forests, both overgrazing and over harvesting contributed to a dramatic decline in forest cover. The history of forestry in the Kyrgyz Republic is broadly similar to that observed in western Europe: excessive timber harvesting in the first half of the 20<sup>th</sup> century resulted in a dramatic decline in forest cover, and led to the development of institutions to improve forest management and restore depleted mountain forests. This period of timber exploitation was followed by one of severe overgrazing, which further degraded forest cover and interrupted natural regeneration.

1.5 This review focuses on Kyrgyz mountain forest and pasture resources and their use. Three key challenges face managers and users of natural resources in mountains of the Kyrgyz Republic:

- ③ Poverty is high in the Kyrgyz mountains and communities depend on forests and pastures for income and subsistence. The rayons classified as ‘mountainous’ comprise an estimated 20 percent of the population (900,000 people) and have the highest poverty levels in the Republic. In rayons entirely within the mountainous region, more than 70 percent of the population is classified as poor and 45 percent as extremely poor. The communities in these regions rely to varying degrees on forest and pasture resources for subsistence and income, especially with regards to pastures for small-scale livestock production, fuelwood from forests for household energy needs, and non-timber forest products for food, income, and health care. Scarce employment opportunities, higher energy prices, and reduced public sector support to the rural areas have increased pressure on natural resources (especially wood and pastures).
- ③ Mountain forests and pastures have been degraded as a result of overuse in the past, the effects of which are still reduced productivity and the need for ongoing restoration. The costs of restoring the ecosystem function and productivity are substantial and beyond the current financial capacity of the Republic, and continued degradation will erode future opportunities and further increase restoration costs. This degradation has costs beyond those of the pastures: reduced vegetation cover reduces the watershed protection value of these areas and increases the risk of landslides, flooding downstream, and heightened fluctuations in river flows.
- ③ Opportunities for sustainable development of forest and pasture resources are hampered by low public sector investment, lack of an enabling environment for private sector investment, and weak capacity for community-based methods of managing mountain natural resources. The government has only started to reform its natural resource management policies and practices to meet the needs of rural mountain communities and protect environmental values. The Kyrgyz people consulted during the review are deeply concerned over the poor condition of mountain resources, which have been degraded as a result of overuse of forests and pastures since the 1920s, and enthusiastically support new ideas for improving their environment and its economic benefits. However, many stakeholders continue to expect that a range of government-financed programs are the solution to these problems, and efforts to engage local communities in contributing to improved natural resource management are insufficient.

1.6 The objective of the report is to: (i) describe current conditions, trends, and policy framework in forest and pasture management in Kyrgyz Republic, (ii) examine the policy framework with respect to the promotion of sustainable use of forests and pastures and poverty alleviation; and (iii) identify opportunities for pasture and forest resource use to contribute to improved livelihoods and long-term public benefits, within the framework

of the ongoing processes for preparing the Poverty Reduction Strategy Paper (PRSP) and the Country Assistance Strategy (CAS).

1.7 The review addresses the roles of the rangeland and forest sector in meeting three objectives of the CAS: reduce poverty; attain sustained growth through the removal of impediments to private sector activity; and improve governance through deregulation.<sup>1</sup>

1.8 The National Strategy for Poverty Reduction (NSPR), recently prepared by the Kyrgyz Republic, also identifies poverty alleviation as its most important development challenge and will serve as a blueprint for the Government's investment program, including projects to be financed with international assistance, for the period 2001–2003. The broad objectives of the program are poverty reduction, economic growth, and governance reform. Within this framework, the NSPR recognizes the linkage between sustainable natural resource use and poverty reduction; and specifically identifies the restoration of natural resources and improved pasture management as national priorities. The NSPR also recognizes three issues with applications in the natural resource management issues identified in this sector note: (i) gradual strengthening of local self governance by transferring some functions from central line ministries and departments to local governments (city councils and ayl akmotu); (ii) supporting private sector involvement in tourism; and (iii) expanding the use of micro-credit facilities in attacking rural poverty and unemployment.

1.9 Poverty alleviation is the most important development challenge facing the Kyrgyz Republic in the years to come. Agriculture accounts for an estimated 41 percent of the Kyrgyz GDP. Because poverty is more severe in rural areas, where agriculture is the main livelihood, the core of the poverty reduction strategy must focus on increasing rural employment and rural growth, with agriculture leading the way. The long-term development of rural economy depends on proper management of natural resources. Thus, policies that arrest natural resource degradation and soil erosion and improve the efficiency of natural resources use, all contribute also to rural growth and poverty reduction.

1.10 The review mission was carried out from May 1 to 15, 2000, and was based on field visits of international and national experts in forest management, economics, pasture and livestock management, forest laws and institutions, and forest policy. The review builds on the efforts and results of the Kyrgyz Swiss Forestry Support Program; the international consultants were financed through the Finnish Consultant Trust Fund administered by the World Bank. It also builds on the Bank's experience in the Kyrgyz Republic especially through the Sheep Development project. A workshop with a diverse group of 35 individuals, entrepreneurs, and representatives of state agencies and NGOs from urban areas (mainly Bishkek), and from the regions was held in Bishkek to identify social and technical issues and recommendations for future action.

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<sup>1</sup> The review follows on the Bank's 1996 Strategy for Rural Growth and Poverty Alleviation, which identifies the need to increase agricultural productivity through sustainable natural resources management as a key challenge for rural development.

## II. Overview Of Mountain RANGELAND And FOREST Resources

2.1 The Kyrgyz Republic is divided into three zones: (i) the lowland and foothill zone ranges up to about 1,500 meters, now dominated by irrigated agricultural lands and settlements (including cities); (ii) the mountain zone between 1,500 and 3,000 meters comprised of grasslands, shrubs, and forest communities; and (iii) the high mountain or alpine zone comprised of alpine grasslands, permanent snow fields, glaciers, and rocks.

### A. RANGELAND AND FOREST RESOURCES

2.2 Rangelands and forests are the dominant land cover in the Kyrgyz Republic, covering 49 percent of the largely mountainous country. By comparison, arable land covers 7 percent, mainly in the valley bottoms and foothills (Table 1). Because of the Republic's mountainous terrain and poor access roads, only about 50 percent of the territory is accessible to settlements, forest, agriculture, and/or pasture management.

<b>Land Use</b>	<b>Area (million ha)</b>	<b>Percentage of Total Land Area</b>
Rangeland	9.18	45
Arable land	1.37	7
Forest land with forest cover	0.85	4
Forest land w/o forest cover	2.13	12
Other	6.32	32
<b>Total</b>	<b>19.85</b>	<b>100</b>

Source: Natstatkom (1999).

2.3 **Grassland characteristics.** Rangelands cover 89,000 km<sup>2</sup> (45 percent of the country). The majority of pasture is located at altitudes between 1,000 and 3,500 meters, and 25 percent is found above 3,500 meters. There are three main zones<sup>2</sup>:

- i. 39,000 km<sup>2</sup> of summer pasture at elevations above 2,500 m, with a three to four-month grazing season (from June to September), found mainly on slopes dominated by grasses (e.g., *Festuca valesiaca*) or sedges (*Carex* and *Cyperus*);
- ii. 27,000 km<sup>2</sup> of spring/fall pastures at elevation from 1,500 to 2,500 m, with a six-month grazing season. The vegetation is dominated by fescue grasses, but also includes *Artemisia* (in drier areas and those that have been overgrazed) and herbaceous legumes (e.g., *Medicago*, *Trifolium*, and *Astragalus*).
- iii. 23,000 km<sup>2</sup> of winter pastures, defined by winter use patterns rather than elevation or species composition. Winter pastures are typically near human settlements,

<sup>2</sup> Fitzherbert, A. 2001. Country Pasture/Forage Resource Profiles, Kyrgyzstan. Published by FAO.

and in remote areas with light snow and available water, often below 1,500 meters, but in some areas as high as 2,700 meters.

Table 2 summarizes average yields with present management practices.

Type of pasture	Area ('000 ha)	Area (percent)	Average yield, kg/ha	Fodder resources ('000 tons)
Spring-Autumn pastures	2,697	30	420	1,135
Summer pastures	3,889	43	550	2,141
Winter pastures	2,285	25	270	615
Hayfields	219	2	1,530	334
<b>Total</b>	<b>9,090</b>	<b>100</b>		

2.4 **Forest characteristics.** Forests cover 850,000 ha, or only 4.2 percent of the country. The Department of Forestry (DoF) manages the majority of forest lands (0.77 M ha), and surrounding/associated mountain grasslands; together these comprise the “State Forest Fund” which totals 3.2 M ha. The remaining forest lands not managed by the DoF are under the jurisdiction of municipal governments, zapovedniks (nature reserve) and other state organizations. Coniferous stands account for more than one-third of the forested areas managed by the DoF (Table 3). Broadleaf stands dominated by maple, poplar, and birch cover 6 percent and those dominated by nut and fruit bearing species such as walnut, pistachio, and almond cover 13 percent (Table 3). The forests are largely fragmented into tracts of less than 4,000 ha

2.5 Geographically, the forests are divided into three zones

- i. The forests in the northern part of the country are dominated by spruce (*Picea schrenkiana*), sorbus (*Sorbus tianschanica*), junipers (*Juniperus* spp.), and fir (*Abies semonovii*), with shrubs such as barberry (*Barberis* spp), buckthorn (*Hippophae rhamnoides*) and wild rose (*Rosa* spp).

Forest Types and Main Species:	Hectares	Percent
Coniferous (main species are juniper, spruce, and fir)	280,000	37
Broadleaved (main species maple, birch, poplar and elm)	49,000	6
Fruit and nut trees (main species walnut, pistachio, and apple)	98,000	13
Shrubs	340,000	44
<b>Total</b>	<b>767,000</b>	<b>100</b>

- ii. The forests in the central part of the country contain unique stands of walnut (*Juglans regia*) forests and are considered the center of origin of cultivated fruit-bearing species such as apple (*Malus* spp.), pear (*Pyrus* spp), pistachio (*Pistacia vera*), and almond (*Prunus amygdalus*)
- iii. The forests in the arid southern mountain ranges are dominated by junipers (*Juniperus serawschianica*, *J. semiglobosa*, and *J. turkestanica*).

2.6 The fauna of the mountain forests and rangeland includes species of wildlife that are important with respect to mountain ecology, for the diets and incomes of local peoples, and as viewing attractions for the developing tourism industry. The species include small fowl such as pheasant, ducks and partridges, marmots and four species of large mammals:

- i Argali, or Marco Polo sheep (*Ovis ammon*) are abundant in the mountain borders with China in the Issyk-Kul region, and with Tajikistan. The government estimated the number of argali at 16,600 in the year 2000. This subspecies is included on Appendix II of the Convention on International Trade in Endangered Species (CITES), and therefore an export permit must accompany trophies or animal parts that are exported from the country. The Kyrgyz Republic is not a signatory of CITES, so export permits for trade in this subspecies are provided through Moscow. A second subspecies of argali (*O. a. karelini*) occurs in the Kyrgyz Republic, but as small, fragmented populations along the main spine of the Tian-Shan;
- ii Ibex (*Capra sibirica*) are common in most high mountain areas with cliffs and rock cover. According to government statistics, there are 65,000 ibex in the country. Ibex are not listed under the Convention on International Trade in Endangered Species (CITES) or the Kyrgyz Red Data Book; and
- iii Roe deer (*Capreolus capreolus*) and wild boar (*Sus scrofa*) occur in most brushy or forested areas, but in relatively low densities. According to government estimates, populations of both are about 5,000 individuals.

2.7 In addition, there are four species of large mammals in the Kyrgyz mountains which are important to mountain ecology. Three of these are targets of recovery and conservation efforts by national and international groups:

- i Bear (*Ursus arctos*). There are several subspecies of bears in the Kyrgyz Republic. There is little information on the taxonomy, distribution and abundance of these subspecies, but their status is considered rare or endangered.
- ii Maral, or elk (*Cervus elaphus*), was formerly widespread but now endangered, and is a candidate for intensive recovery efforts.

- iii Snow leopard (*Uncia uncia*). The Kyrgyz population was estimated at between 500 and 600 individuals in 1990<sup>3</sup>. This represents a substantial decline in numbers from previous periods. Although field surveys to estimate total population numbers have not been carried out since 1990, surveys of relative abundance suggest that numbers may have declined by 50 percent or more in this period. Poaching is thought to be the cause of this decline.
- iv Wolves (*Canis lupus*) are abundant and reported to be causing, or contributing to, reductions in the populations of argali, deer, and other ungulates. The discontinuation of government financed bounties for wolves and the curtailing of other efforts to control their numbers were cited by shepherds as important reasons for why wolf populations are currently at high numbers. High wolf densities constitute a constraint to increasing sheep and other livestock numbers in remote mountainous areas.

## **B. OWNERSHIP AND MANAGEMENT OF RANGELAND AND FOREST RESOURCES**

2.8 According to the constitution (1993), all rangeland is the property of the State, but the State can grant user rights in the form of longer term leases. Land taxes/fees are collected by the local government (ayl akmotu), which can keep part for the exclusive right of development, and the rest is passed on to rayon or oblast authorities. To date, most land has been leased on an annual basis, but medium term leases (five years) for rangeland have been initiated in some pilot areas. Other laws and decrees introduced in 1991 and 1994 also state the principle of grazing fees. Currently, fees for pasture leased by farmers/herders include land tax and pasture lease. In Issy-Kul oblast in 2000, for example, a farmer paid a total of 15 soms/ha/yr for pasture, which included 7 soms for land tax and 8 soms for the lease of pasture. The fees are not yet differentiated based on the quality of pasture. The ayl akmotus and rayons rely on the revenue from pasture fees for services (health, schools, roads, etc.), which is an incentive to maximize revenue, potentially at the expense of the resource base (e.g., by overstocking pastures).

2.9 The largest proportion of rangelands, 5.6 million ha, is administered by the oblast. These rangelands are located in remote mountain areas and serve mainly as summer pasture. Rayon and village governments administer 2.4 and 1.2 million ha respectively. These rangelands are located nearer to towns and villages and are more intensively used. Finally, the leshozes (forest farms) administer a small area of grasslands (240,000 ha total) under lease arrangements with the State Forest Agency. User fees are highest for village pastures, where grazing pressure is highest, lowest in remote high pastures (where grazing pressure is lowest), and intermediate in 'intensive pastures'

2.10 Responsibility for monitoring of rangeland has been given, by special government order in 1999, to the Pasture Monitoring and Protection Unit of the Kyrgyz Land Management Institute (Gyprozem) and the Pasture Research Institute, both financed

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<sup>3</sup> Source: International Snow Leopard Trust

by the state budget. 60 land management specialists employed at the rayon level and about 450 at the ayl akmotu level implement this, of which 150 are specialized in rangelands. The latter are backed up by approximately 20 research/monitoring staff at Gyprozem headquarters. The ayl akmotu range specialist's role includes the collection of taxes and pasture fees, monitoring of pastures, and delivering advice on pasture management and improvement.

2.11 Forests are managed by the DoF, the oblast forestry departments, and the leshozes. The DoF is the central body and is responsible for oversight of forest management at the national level, through long range planning, evaluation of the effectiveness of programs, and working with the legislative bodies to budget forestry investments. Leshozes are responsible for forest protection and implementing forest management plans at the site level. They also grow seedlings for afforestation and commercial purposes, and lease leshoz resources to residents and other users. The oblast forestry departments assist and monitor the leshozes within the oblast. The 41 leshozes average 62,800 ha in area and 17,100 ha in forest cover. Leshozes employ 5,508 people, 1,971 of whom are managerial staff financed directly from the state budget.

2.12 The policy framework for forestry is defined in the Forest Policy Concept and the legal framework is defined in the 1999 Forest Code. Together, these provide an enabling framework for forest conservation and use, which recognizes watershed protection as a key function of the Kyrgyz forests. The stated strategy is "protection through production": forests should be managed to yield a sustained flow of economic benefits, which provide the forest managers/users an incentive to protect forest resources. The means identified in the Forest Policy Concept and Forest Code for achieving this are: (i) improve the management of leshozes by granting them increased autonomy; (ii) involve local population and stakeholders in forest development *inter alia* by expanding leases of forest land; (iii) increase the involvement of the private sector in productive activities; and (iv) increase the effectiveness of the public sector by redefining the role of the state in the forest sector.

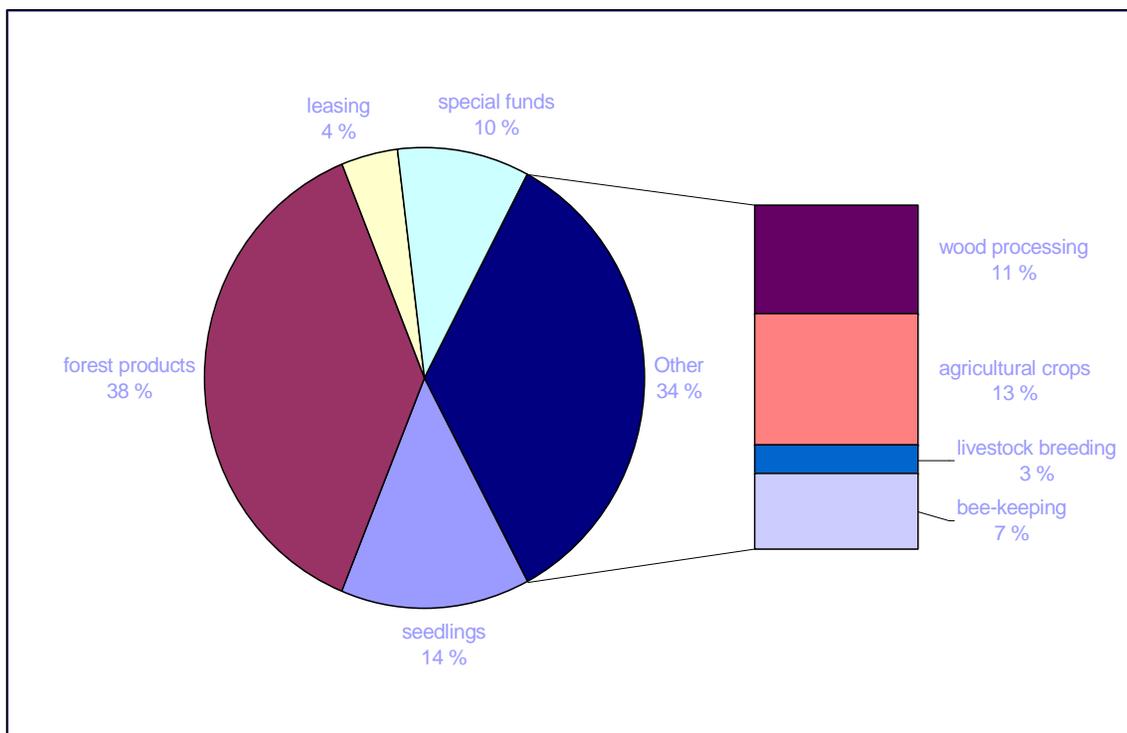
2.13 The Kyrgyz Forestry Concept recognizes the following institutional/policy constraints to progress in sustainable development of the forest sector: (i) the lack of resources, especially for leshozes; (ii) the need for technical innovations which could promote the link between forest conservation and use; (iii) an overly bureaucratic centralized management structure; and (iv) a legislative framework which relies too much on control and not enough on incentives.

2.14 Forest management is financed through the state budget and through the revenues from production activities in leshozes. In 2000, the total expenditures for forest management were KGS 65.7 M (US\$1.4 M), one-fourth coming from the state budget and the remainder coming from revenues generated by the leshozes. Figure 1 summarizes the sources of leshoz revenues: 27 percent were derived from activities such as agricultural crops, livestock breeding, and beekeeping. There is wide variation in the revenue generating capacities of the leshozes: in resource-rich leshozes, more than 90 percent of financing needs are derived from the sale or use of leshoz resources (timber and non-timber forest products and the use of grasslands and arable land within the

leshozes), whereas 'resource-poor' leshozes derive less than 10 percent of their budgets from revenue generating activities.

2.15 The Division of Hunting Enterprises and Supervision within the Ministry of Environment and Emergency Services has primary for regulating hunting in the country. Hunting rights are leased to three types of entities: (i) private firms that cater exclusively to foreign hunters, (ii) the Associations of Kyrgyz Hunters, which largely control hunting access for Kyrgyz citizens but have a small number of foreign clients, and (3) Glavaxota, formerly a government department which has been relegated to the role of a publicly-supported private hunting firm.

**Figure 1. Leshoz Revenues 1999**



## C. BENEFITS OF RANGELAND AND FOREST RESOURCES

### Direct Use Benefits

2.16 During the Soviet era, the Kyrgyz Republic specialized in the production of wool for the garment industry of the USSR. Although the numbers of sheep and other livestock have declined markedly, sheep and wool production are still among the most important activities in the Kyrgyz economy, and are the dominant agricultural occupation in the central and eastern mountains of the Kyrgyz Republic

2.17 The main direct benefits of forests are timber, fuelwood, and non timber forest products such as medicinal plants. The majority of forests are classified as protection

forests where harvesting is permitted only for 'sanitary' purposes (i.e., to remove diseased trees or to reduce the risk of forest fires), rather than for commercial operations. The volume of commercial logging for industrial use (not including fuelwood) is small, averaging approximately 10,000 m<sup>3</sup> in recent years, and the wood processing industry is limited to a small number of state-run sawmills. Some 90 percent of the total demand for wood products has been met with imports originating mostly from Russia and to a limited extent from Kazakhstan. Fuelwood is an important source of energy, especially in rural areas, but data are not available on the volumes harvested

2.18 Wood, dried animal manure and coal are important sources of energy in the Kyrgyz Republic, and households are the largest consumers of wood. A 1997 household survey found that wood or coal was used by 63 percent of the population for heating and by 34 percent for cooking. Coal and wood are used interchangeably, and coal is preferred because of its easier use, but wood is less expensive. Rural households are more dependent on fuelwood, dung and coal than urban households. For urban households that reported using fuelwood, average *per capita* wood consumption was 1.5 m<sup>3</sup> per annum compared to 2.65 m<sup>3</sup> for rural households. It would be speculative, however, to translate these into estimates of annual fuelwood consumption because many villages rely largely on animal dung as a source of fuelwood.

2.19 Non-timber forest products (NTFPs) are a source of food, income, and medicine for local communities. An estimated 600 species of wild plants, including 200 species of medicinal plants, are used either for subsistence or for commercial purposes, or both. The most commercially important NTFP in the mountain areas is walnut because of its high value and demand in local and regional markets. For the 50,000 inhabitants of the walnut forest zone of the southern Kyrgyz Republic, walnut fruits are an important source of income. Other fruit and nuts, such as pistachio, almond, wild apple and plum are also collected, but their yields and commercial values are inferior to walnut. Natural honey has experienced no marketing problems, although better quality management could increase revenues. Medicinal plants are collected by local villagers and leshoz members and sold at local and regional markets and to processing companies in Bishkek.

2.20 Hunting is an important part of local diets and cultural traditions. The fees paid by local hunters are low (300 som for ibex and considerably less for other species). The private fees and government permits for hunting argali and ibex for foreign hunters is much higher. Ibex (*Capra sibirica*) are of high interest to Kyrgyz hunters, but of much lower interest to foreign hunters than Marco Polo sheep. Over the last five years, foreigners hunters have been paying 'trophy fees' of about \$25,000 for Marco Polo argali, and about \$3,000 for ibex. More recently, these costs have dropped to about \$12,000 and \$1,000, respectively.

2.21 The available data on the total value of hunting fees paid to hunting clubs and the government were difficult to estimate, but are thought to be about \$2.0 million annually. In addition, private hunting clubs pay from \$34 to \$52 dollars per 1000 ha to the government as leasing fees. There are an estimated 18 million ha of hunting lands under lease, which yield about \$750,000 in leasing fees to the government.

## **Environmental and Biodiversity Values**

2.22 **Watershed protection values.** Mountain forests and pastures play a central role in watershed protection. Poor management of forests and pastures contributes to soil erosion and degradation, which reduces resource productivity and siltation of downstream irrigation systems and dams. Rangelands, forests, and other natural resources have a number of dimensions which make “markets” work imperfectly and often require government intervention:

- ③ Natural resources management has a spatial impact: deforestation and overgrazing upstream can lead to increased risk of flooding downstream.
- ③ Natural resources management has an inter-temporal dimension: forests that are logged take up to one hundred years to regenerate in boreal and temperate climates. For this reason, conventional discounting techniques are not adequate instruments for making investment management decisions.
- ③ Poor natural resources management can have irreversible impacts, such as the loss of species.
- ③ Some aspects of natural resources management have a global dimension, such as the relationship between ecosystem change and climate change.

2.23 The biodiversity of the Kyrgyz Republic is of global, economic, and cultural importance. The West Tien Shan form the most westerly part of the Himalayan mountain system, and are located at the crossroads of the Palearctic and Oriental biogeographical realms. The varied topography and the mixing of different flora and fauna associated with these realms contribute to unusually high biodiversity levels. The country hosts a diverse number of plant communities, 4,000 species of vascular plants, 500 vertebrates, and a number of threatened species. Many of the unique communities and threatened fauna, such as snow leopard, brown bear, Central Asian mountain goat and argali, occur in the mountains

2.24 The genetic resources of the Kyrgyz Republic include wild relatives of commercialized horticultural and agricultural plants such as apples, walnuts, apricots and tulips, as well as agricultural crops such as wheat, flax, lentil, safflower, and sesame. These are a few of the genetic resources which have led some to consider the Kyrgyz Republic to be a center of Central Asian biodiversity.

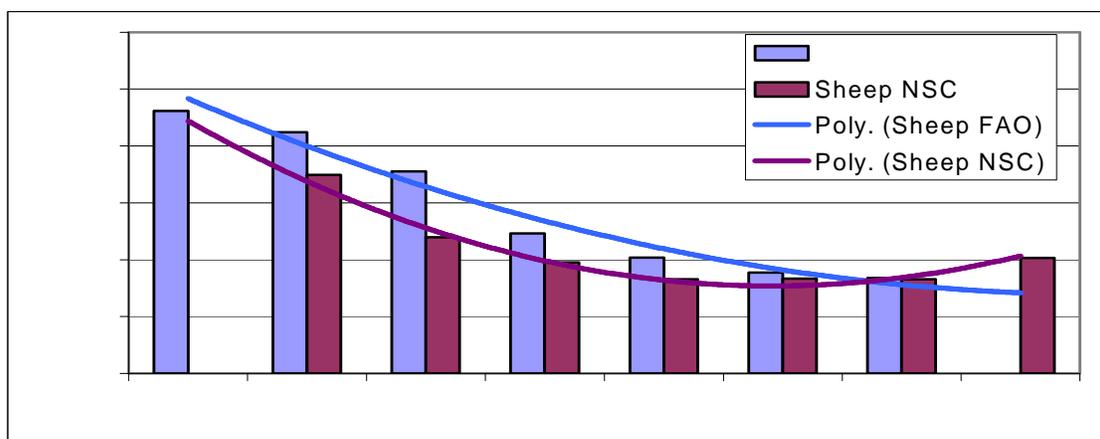
2.25 There are no studies or estimates available on the role that Kyrgyz forests or rangelands play in carbon sequestration.

## D. TRENDS IN RANGELAND AND FOREST USE AND MANAGEMENT

2.26 **Rangeland trends.** The rangelands, especially those outside of the nature reserves (zapovedniks) were heavily grazed beginning in the 1930s. Sheep grazing was managed by the kolhozes and sovhozes, which organized large-scale seasonal movements of sheep between summer pastures in Kyrgyz Republic and winter pastures at lower elevations in the region (Kyrgyz Republic, Kazakhstan, and Uzbekistan).

2.27 After independence in 1991, the number of sheep declined sharply, from 9.5 million animals in 1992 to 3.5 million in 1998 (Figure 2). This resulted from a number of factors, including a collapse of the market for wool, the lack of capital for winter feed (previously provided by the Soviet State), and the division and privatization of state owned flocks. Another contributing or related factor was a shift in area devoted to fodder crops (mainly lucerne, *Medicago sativa*, and sainfoin, *Onobrychis viciifolia*), which serve as winter livestock feed, to wheat production. Since independence, the rise in poverty and end of centrally planned economic activities, livestock production has become increasingly subsistence level, for food and cash income. There are some indications that the number of animals is again increasing, though they are not expected to return to the previous high levels.

**Figure 2. Sheep Numbers in the Kyrgyz Republic, 1992-1999**  
(source: FAO and Natstatcom)



2.28 The degradation of grasslands as a result of overgrazing in the Soviet era was substantial, and resulted in large declines in productivity. Between 1955 and 1985, the area of degraded pastures increased 1.58 M ha to 2.4 M ha, and pastures showing undesirable composition of woody weeds now totals up to 5.4 M ha. These changes have been accompanied by a decline in productivity. As a result of overgrazing, the productivity of pastures has declined substantially from the 1960s to 1993: summer pastures declined from 640 kg/ha to 410 kg/ha; spring/autumn pastures declined from 470 kg/ha to 270 kg/ha; and winter pasture declined from 300 kg/ha to 100 kg/ha.

2.29 Despite the decline in livestock since 1991, the legacy of overgrazing during the Soviet period persists: (i) rainfall still causes topsoil loss and occasional mudflows in highly degraded areas, (ii) a large part of the pasture resource is in poor condition, with 15 percent now covered by non-edible or poisonous weeds and approximately one third dominated by less productive weeds. Overgrazing continues or is expanding in the summer and spring/autumn pastures, especially those in proximity to settlements

2.30 There have been important changes in pastoral transhumance and the utilization of mountain rangelands over the last several centuries (Box 1).

2.31 **Forest trends.** With regard to forests, the history in the Kyrgyz Republic is broadly similar to that observed in western Europe: excessive timber harvesting in the first half of the 20<sup>th</sup> century resulted in a 20 percent decline in forest cover, and led to the development of institutions to improve forest management and restore depleted mountain forests. This period of timber exploitation was followed by one of serious overgrazing, which further degraded forest cover and interrupted natural regeneration of forest tree species.

#### Box 1. Changes in Pastoral Systems in the Kyrgyz Republic

Historically, Kyrgyz nomads used traditional nomadic pastoral production systems that consisted of transhumant grazing of sheep, cattle and horses and, in some areas, yaks and Bactrian camels. Kyrgyz nomads lived in felt tents, *yurta*, throughout the year and rangeland use was regulated by tribal councils. Kyrgyz nomads were renowned for raising horses and fat-tailed sheep. The incorporation of the region into the Russian empire in the late 1800s and Soviet collectivization in the 1920s transformed the traditional family and tribal oriented nomadic pastoral system. A modified transhumance remains:

- ③ fixed settlements in the low mountain areas (1000-2000m) where forage supplements were needed,
- ③ migration to mountain pastures in the summer
- ③ migration among alpine pastures throughout the summer; and
- ③ return to fixed settlements in the winter.

This transhumance system was influenced by the introduction of collective farms in the late 1920s, but the transhumance lifestyle continues to the present. Under the soviet system, land and grazing allocations were managed by local (Soviet) councils, with technical inputs on pasture condition from the State Land Management Committee. The grazing system was regional (international): Kyrgyz sheep were transported to winter pasture in Kazakhstan, and Kazak and Uzbek flocks used Kyrgyz summer pastures. Small livestock owners entrusted their animals to communal flocks, which grazed farm fields in the winter and were guided by hired herders to the mountain pastures in the summer.

Since independence, the livestock sector has experienced a difficult transition:

- ③ there has been a fragmentation of flocks and a reduction in flock size as individual owners become responsible for livestock; many of the smallholders cannot afford transhumance;
- ③ there has been a sharp reduction of winter feed inputs, but individual fodder preservation is increasing;
- ③ there are few technical support services available to herders, and little access to credit;
- ③ herders have altered their grazing and livestock husbandry systems, making maximal use of natural pastures by lengthening the migratory cycle and reducing dependence on expensive cultivated feed and fodder;
- ③ the informal social institutions which were used in the past to herd flocks to remote pastures have broken down somewhat, with the result that remote pastures are underutilized whereas pastures close to villages and settlements near winter pastures are heavily overgrazed;
- ③ pasture leasing, whether by individuals or by groups, is only slowly emerging, and
- ③ rural infrastructure such as roads and watering sites, as well as predator control, have deteriorated after years of neglect, making productive uses of the mountain regions more difficult. As a result of these, most livestock owners now are engaged in subsistence level uses.

2.32 According to FAO statistics, the total forested area in the Kyrgyz Republic has not changed significantly between 1990 and 1995. The available data suggest that at the national level, deforestation is not a major problem, although it remains a problem locally or regionally. For example, juniper forests in the south are reported to be shrinking at an annual rate of 0.7-0.9 percent.

2.33 Concern over the sustainability of fuelwood use in the Kyrgyz Republic is commonly expressed by stakeholders. The impacts of fuelwood collection are usually localized in the vicinity of settlements and roads. Anecdotal evidence indicates that the combination of declining incomes and increasing energy prices have made wood the preferred energy source of rural and peri-urban households. However, data on household consumption patterns are insufficient to evaluate the potential environmental problems associated with further efforts to increase cost recovery for energy, namely deforestation and increased indoor pollution. Also, data are lacking on fuelwood supply, precluding meaningful analysis of the sustainability of fuelwood collection. There are hot spots, especially in the southern forest region, where excessive fuelwood collection is causing forest degradation and deforestation.

2.34 The Kyrgyz-Swiss Forestry Support Program (KIRFOR), funded by the Swiss Development Cooperation, was established in 1995 to facilitate the formation of a government strategy for sustainable forest development. KIRFOR supports the following activities at the local, regional, and national levels:

- ③ At the national level: preparation of new forest policy and legislation.
- ③ At the regional level: development of the National Action Plan for Walnut Fruit Forests, to conserve the biological diversity of unique walnut forests in the southern part of the Republic
- ③ At the local (leshoz) level: the Collaborative Forest Management program for sustainable walnut forest management and assistance to forest management and wood processing activities, to promote forest conservation and job creation in mountain areas. KIRFOR is also piloting the reform of leshoz administrations (Box 2).

### **Box 2. Reform in Leshoz Management**

An early test of leshoz administrative reform is being piloted under the KIRFOR. Under the traditional management model used in leshozes, decisions were made by the director with little delegation of authority. In four model leshozes (Issyk-Kul, Tiup, Ortok, and Usgen), the managers of subunits within the leshoz have been delegated new responsibilities, and a new process of “bottom up” planning is under implementation.

In Issy-Kul leshoz, operations have been divided into five sub-divisions. These sub-divisions are financially and operationally fully independent and are not obliged to favor or subsidize other sub-divisions. The sub-divisions are responsible for their own finances. For instance, they are allowed to use profits as bonus payments to their employees. As a result, the number of people on the leshoz payroll has decreased from 190 to 125 since the pilot reform was started.

These reforms have not been accompanied by a decrease in hours actually worked. The reason is that previously, the combination of low wages, lack of performance-based incentives and monitoring led to an increasing number of “ghosts” on the payrolls, such as relatives of staff members who were paid but did not work for the leshoz. The increased freedom to fix salary levels and to provide incentives has eliminated such practices. Another factor is that the pressure to shed staff because of more efficient management and resource allocation is being counterbalanced with a return to more labor-intensive, but more cost-effective methods.

The compensation structure has been diversified and wage differentiation based on skill and performance has been implemented. For example, professional loggers and chainsaw operators are currently paid up to KGS 800/month (US\$17) while general laborers are paid slightly more than half that amount (KGS 400-500/month). Prior to the reforms such wage differentiation was not possible. It is expected that this will rapidly improve efficiency and enable cost-savings.

**2.35 Wildlife Trends.** For most species of wildlife, there is little or no information on population trends due to the absence of systematic surveys in the last decade. For two species, the Marco Polo sheep and snow leopard, which are better studied than others because of their economic or ecological importance, the trends in population numbers differ.

- i The “poli” Marco Polo sheep (*Ovis ammon poli*), which is a popular trophy hunting animal and an important source of income for hunting clubs, is thought to have increased during the transition. According to government figures, the number of argali in the Kyrgyz Republic increased from 13,000 to 16,600 between 1996 and 2000. During the same period, however, the number of “trophy males” (older males of the population with large horns, which are favored by hunters) has declined dramatically under heavy hunting pressure.
- ii Snow leopard (*Uncia uncia*). According to Koshkarev and Vyrypaev<sup>4</sup>, the population of snow leopards in the Kyrgyz Republic is currently between 150-200 individuals, down from 500 to 600 individuals animals in the early 1990s. This is difficult to substantiate under the current situation of irregular surveys and the naturally low population density of the species. Poaching is reported to be the main cause of this decline, the incentive for which is the high value of the pelts and other body parts on the international market.

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<sup>4</sup> What Has Happened to the Snow Leopard After the Break-Up of Soviet Union?

### III. Challenges and Opportunities in the mountain Rangeland and Forest Sector

#### A. POVERTY AND NATURAL RESOURCE USE IN MOUNTAIN COMMUNITIES

3.1 The Kyrgyz Republic is one of the poorest of the Countries in Transition (CIS), with an average per capita GNP of US\$400. An estimated 55 percent of the population is classified as poor, 80 percent of whom live in rural areas. From 63 percent to 74 percent of the populations in rural mountainous rayons live in poverty, the highest proportion in the Kyrgyz Republic (see footnote to Table 4 for a definition of mountainous rayons). Together, these regions comprise 60 percent of the total population in the country. For both mountainous and forested rayons, men are significantly more likely to be poor than women. The inhabitants of the Kyrgyz mountains depend strongly on crops, mainly potatoes, livestock, and non-timber forest products, mainly medicinal plants, for subsistence. The very poor are typically unable to afford livestock and rely on crops and non-timber forest products.

Type of rayon	Very poor	Poor	Non-poor	Population	
	Percent			No.	Percent
Only mountain*	46	74	26	363,338	7.2
Only forests	30	66	34	639,916	12.8
Mountain & forests	23	63	37	2,046,262	40.8
No mountain, no forests	17	40	60	1,964,235	39.2
Whole country	23	55	45	5,013,751	100.0

\* Under Parliamentary Decree #377, 'mountain' rayons are identified based on elevation, agro-ecological conditions and remoteness. 'Forest' rayons contain at least one leshoz (state forest district), although for some rayons, the proportion of land covered in forests is low.

Source: Natstatkom (1999).

3.2 Rural mountain communities are increasingly dependent on forest and pasture resources for subsistence and income. The key challenge inherent to these facts on rural poverty and natural resource use is how to promote the use of natural resources more effectively and sustainably to reduce poverty and increase incomes.

3.3 There are significant opportunities for improving the benefits from mountain rangelands and forests. The use of rangelands and forests is central to rural subsistence, economy, and culture, and there are important opportunities to expand their benefits. Natural pastures are about 9.1 M ha, of which approximately 30 percent are spring-autumn pastures, 25 percent winter pastures and 43 percent summer pastures. The limiting factor for expanding livestock numbers is the carrying capacity of winter pastures and the spring-autumn pastures. However, many smallholders are not using high altitude pasture, and the lack of summer pasture is affecting these owners. Assuming that the animals are seasonally rotated from one pasture type to another, the current number of

sheep, estimated at 4.0 million, together with about 1.2 million horses and cows, can be kept permanently on available pastures. The data are not sufficient to provide an accurate estimate of the carrying capacity of sheep on state pasture lands, but rough assessments indicate that the maximum potential for expansion is between 0.5 and 1.5 million sheep.

3.4 Forests are also important to rural livelihoods, but they are a minor part of the national economy (approx. 0.1 percent of GDP) and the small size of the forest estate greatly limits the opportunity to expand this. Also, for most remote forests, the investments in forest roads and harvesting systems that would be required to develop commercially viable and environmentally sustainable timber operations would be prohibitively expensive. There are, however, opportunities to modestly increase timber yields in localized areas in a sustainable manner and thereby increase incomes for the rural poor and generate revenues needed for forest protection and management (e.g., afforestation).

## **B. IMPROVING ACCESS TO RESOURCES AND PROMOTING COMMUNITY BASED NATURAL RESOURCES MANAGEMENT**

3.5 The highest priority for improving the contribution of rangeland and forest resources to rural livelihoods is to improve access to their resources and supporting tenure systems. The combination of improved access to rangeland and forest resources and community based methods of management has proven effective in improving natural resources management and contributing to rural livelihoods in two other countries in the region (Box 3). Community-based approaches were used historically in the management of mountain rangelands, but these were replaced by more “modern” top down approaches. Several projects are now supporting community based approaches to natural resources management in the Kyrgyz mountains.

3.6 **Improving access to resources and land tenure.** A key issue for improving livelihoods and contributing to improved management of mountain rangeland and forest resources is to improve access to resources and, in the case of mountain rangeland and agricultural lands, of land tenure arrangements. There are three opportunities for improving resource management and contributing to rural livelihoods.

- ③ Tenure arrangements can be improved by lengthening the lease period beyond the current standard period of one year. Multi-year leases would enhance the ‘stake’ of the lessee in the condition of the pasture and promote more sustainable pasture use in comparison to the current arrangements. An important pilot experiment in pasture leasing is being carried out in three rayons with the support of the Sheep Development project, where individuals agree to, currently, 5-year leases of ayl akmotu rangeland, and to pasture monitoring by the local Gyprozem staff. It is understood that the majority of lease arrangements are now with individuals and private firms. However, the government may consider entering into lease arrangements with livestock associations consisting of groups of private individuals. A structure whereby individual livestock-rearing families hold contracts with the association in return for central services might be an effective

way to improve the productivity of animal husbandry and promote sustainable land-use patterns. These approaches need not be entirely mutually exclusive. The new associations could sign agreements to lease selected pastures to the larger and more economically efficient commercial farmers under the sort of long-term lease arrangements described above.

- ③ The introduction of provisions for subleasing and transferability would enable consolidation of pasturelands, development of investment potential by providing collateral, and gradual specialization of farmers in livestock production.
  
- ③ Improved access to credit and extension services would improve the ability of rural communities to participate in the sustainable development of mountain resources.

3.7 With regard to mountain agricultural land tenure, the non-forested lands under leshoz management are mainly pasture lands and small areas of arable land. Although the leshoz agricultural lands are small in area, they are vital in the subsistence of mountain leshoz communities. The leshoz agricultural lands have not been privatized, in contrast to agricultural lands within the sovhozes and kolhozes: the leshoz administrations lease these lands to members of the community for in-kind or cash payments. The leases are renewed annually, which discourages investment by the farmers. For example, the mountain agricultural zone is appropriate for fruit farming (mainly apples, plums, pears, and apricots). The weak land tenure of agricultural lands within leshozes is an important reason why few investments have been made in establishing fruit orchards: farmers are unlikely to invest in fruit trees when their long-term access to the farmland is uncertain. To create incentives, the tenure arrangements should be improved (e.g., through privatization, opportunities for long-term leases, and the right to sublease to another farmer, which could become a source of rural credit).

3.8 An important experiment in sustainable forestry is the Collaborative Forest Management (CFM) program, financed by KIRFOR. The pilot CFM program is a good first step in promoting community-based methods of forest management. The CFM is being implemented in several leshozes with walnut forests in the southern part of the Republic, where pressures on the natural walnut forests are high. The development of the lease arrangements is an important step in sharing economic benefits with local community members. Under these leases, individuals obtain the right to harvest walnut fruits in a specific area in exchange for planting walnut seedlings provided by the leshoz. Afforestation of depleted walnut forests is a major objective of southern leshozes. A Board specially convened to implement the pilot CFM program handles disputes or changes to the lease. The user fees have consisted of labor inputs to afforestation, although government hopes to move away from in-kind to cash payments. However, cash payments in rural areas are especially difficult, and the current use of in-kind labor allows the state's forest planting activities to continue.

3.9 The means by which the successful CFM program can be replicated more widely, and benefit more Kyrgyz people, is not yet clear. Two immediate options are to:

- ③ Increase the number of walnut forest leases to meet the growing demand. The DoF is expanding the program. However, there is a constraint on how many leases a lessee is able to manage under the current model: the lease currently provides access to walnut stands of 5-10 ha.
  
- ③ Extend the experiment to management of natural forest (e.g. spruce) or forestry plantations. There should be an opportunity to develop leases in the area of harvesting contracts and concessions, or roadside sales to the private sector. However, a shortcoming of the Forest Code is the short treatment given to the promotion of private activities, which in the current form is limited to the forest plot lease arrangements being implemented under the CFM. The Code contains no additional provisions for private commercial activities. Selected changes in lease arrangements, contracting procedures and conflict resolution practices could improve the management and attractiveness of the program, and thereby support its replication.

**3.10 Extension services and access to credit.** Improving the livelihoods of mountain communities will require technical assistance in the use of mountain forest, pasture, and agriculture resources. Given the poverty levels in the mountainous areas, and the downstream impacts of poor natural resource management there, the development of extension services and other support programs should be given higher priority. Rural communities would also benefit from the development of farmers' associations or specialized users' groups such as crop-tree or livestock associations. Such programs should be developed with strong community participatory orientation, and with specific gender capabilities. These should emphasize sustainable natural resource use for subsistence and income generation (pastures, gardens, orchards, forests, and NTFPs).

**3.11 Promotion of community-based systems of resource management.** The implementation of community-based grazing management and animal husbandry through local herders' associations can be effective in improving natural resource use and social cohesion. Historically, Kyrgyz villagers cooperated in livestock herding, and indigenous knowledge of rangeland management was well developed. Some of these customs and practices continued during the Soviet era, especially in mountainous areas, but overall, the traditional system of livestock and range management has diminished since independence. For example, livestock owners no longer entrust their sheep to other herders to guide to the high summer pastures, and elect instead to maintain small flocks year round on village pastures, which has led to severe erosion. There is a strong need to establish farmers'/livestock associations which could bring about more cost effective monitoring and management of pastoral ecosystems and increase the negotiating and bargaining power of their members, thereby raising their economic opportunities. Community based systems will be needed if the DoF is to pursue its objectives of restoring forest or other vegetative cover to the upper watersheds.

**Box 3. Example of Watershed Rehabilitation and Poverty Reduction through Community-based Approaches**

The Turkey Eastern Anatolia Watershed Rehabilitation Project (US\$115 million, FY93) has two objectives: restoring sustainable land-use management to degraded watersheds in three provinces of the Upper Euphrates River Basin, and increasing the incomes of the local population living in these areas, among the poorest in Turkey. This project provides a good example of community-based natural resources projects that empower local communities in managing their use of natural resources (forest, pastures, soils and agriculture, water and wildlife).

The key features of the project design are:

- ③ villagers participate in the design of investments for their specific micro-catchment. Based on their specific problems and opportunities, they select the most appropriate investments from a menu of interventions,
- ③ villagers implement the subprojects, with contributions such as labor, in an integrated fashion working with sectoral agencies (agriculture and forestry).

Some examples of the investments are:

- ③ rehabilitation of degraded slopes by planting trees, especially fruit and nut trees, conversion of marginal croplands to pasture or hayfields, and reduction of grazing intensity through prohibition (e.g. fencing) and positive incentives;
- ③ small-scale irrigation works for mountain agriculture;
- ③ conversion of rain-fed croplands to irrigated orchards using indigenous fruit and nut trees;
- ③ beekeeping.

Some benefits of the project are improved:

- ③ rural employment, income, and living standards
- ③ skills and confidence of communities and government agencies in natural resources management
- ③ interagency collaboration
- ③ new opportunities for women
- ③ land use and soil conservation, and flood prevention
- ③ ecological balance, improved landscape/aesthetics.

### **C. STRENGTHENING INSTITUTIONAL SUPPORT FOR RANGELAND AND FOREST MANAGEMENT**

3.12 There are institutional challenges to achieving improved management of mountain rangeland and forests. The changes which have occurred since the transition with respect to market reform, land and livestock ownership and governance, necessitate changes in how to organize, govern, and monitor rangeland and forest use. Despite the new decrees and laws on pasture use passed in the last decade, a framework for pasture management has not yet been found which offers security of livelihood to herding households and promotes sustainable long-term pasture management. The main issues to be addressed on institutional and human capacity are as follows:

- i. The institutional arrangements for rangeland management are too complex, and policy planning at the central level and management and monitoring at the local and regional levels are weak. A more efficient system is needed which places greater responsibility for pasture management with the users, with the support of local institutions. The integration of livestock and pasture management at a relatively large scale, for example, could help mitigate the damaging

environmental effects of the concentrations of livestock kept by subsistence pastoralists near settlements, and provide a viable scale of enterprise for state or international donor investment.

- ii. There is little cooperation among the agencies responsible for rangeland management and forestry. Pasture lands are administered in a patch-quilt fashion by public authorities at four levels: oblast governments (5.6 M ha of remote pastures), village councils (1.2 M ha of village pastures), rayon government (2.4 M ha of intensive use pastures at middle elevations), and leshozes (forest farms, 0.2 M ha). There is virtually no coordination among these agencies. And while each of them obtains revenues from users, these revenues are not being reinvested in rangeland management or improvement programs.
- iii. Management is often driven by maximizing revenue (taxes, grazing fees) rather than sustainable use, a problem that is encouraged by the financial management of pasture leases and their revenue allocation. The ayl akmotus and rayons rely on the revenues from pasture use to provide village services (health, schools, roads, etc.). There are two problems with this system: (i) it provides an incentive to maximize revenue, potentially at the expense of the resource base (e.g., by overstocking pastures); and (ii) no investments are being made in pasture management and improvements. In forestry, the leshozes' reliance on revenues that they generate from forest resources, including timber harvesting and processing, could be also an incentive to overutilization. A simple mechanism is needed that provides separation between commercial (resource use and processing) and regulatory (policy-setting and permitting) functions. The different functions of the central DoF, the leshozes, and the Ministry of Environment and Emergency Services do provide such a system of checks and balances, but a similar arrangement for pasture management is lacking.

3.13 In addition to the lack of coordination among the layers of government responsible for rangeland management, there is little coordination between the management of mountain forests and pastures. The result is a lack of coordination in addressing the problems and opportunities of forest and pasture resources (e.g. deforestation, revival of the livestock sector, and biodiversity conservation) within a broader, integrated framework for natural resources management.

#### **D. SUPPORTING RANGELAND AND FOREST USES AND DIVERSIFYING INCOME SOURCES**

3.14 Improving the use of mountain rangelands will require building local capacity and social cohesion through the development of herders or livestock associations, the introduction of appropriate technologies to improve productivity, and investments in mountain infrastructure (e.g. roads), which have degenerated in the absence of investment.

3.15 The area of natural pastures is about 9.1 M ha. However, many smallholders are not using high altitude pasture, and the lack of summer pasture is affecting these owners. Assuming that the animals are seasonally rotated from one pasture type to another, the current number of sheep, estimated at 4.0 million, together with about 1.2 million horses and cows, can be kept permanently on available pastures. The data are not sufficient to provide an accurate estimate of the carrying capacity of sheep on state pasture lands, but rough assessments indicate a potential for expansion between 0.5 and 1.5 million sheep, with winter grazing as the major constraint. These numbers can increase with improved fodder cultivation and preservation.

3.16 In addition to increasing livestock uses of undergrazed summer pastures, there is a need for livestock owners and producers to work toward mitigating the risk of the unpredictable and harsh mountain environments. The traditional strategy for mitigating this risk, developed over the centuries by indigenous populations, consisted of five main elements: (i) asset diversification, (ii) income diversification, (iii) increased access to production and market information, (iv) herder/farmer organization, and (v) increased access to external resources. For Kyrgyz farmers and herders this would entail:

- ③ raising diverse livestock species (fine-wool sheep, meat sheep, cattle/yaks and horses);
- ③ risk avoiding herd/flock management, proper selection of pasture, agreed allocation of seasonal pasture (including emergency grazing reserves) and fodder preservation;
- ③ risk sharing through herder organization and/or insurance for snow or drought;
- ③ developing ways to earn income not only from the sale of livestock but also from the sale of specialty livestock products (fine wool, coarse wool for carpet/felt production, yak meat, etc.) or certain classes of animals (higher value, young lambs for meat), hay, forage seed, medicinal plants collected from pastures, and income from tourism or hunting;
- ③ obtaining up-to-date information on and training in livestock production technologies, including pasture management and fodder production, long-term weather forecasting, and market prices for livestock and livestock products; and
- ③ improved access to markets, to credit, veterinary services, and other livestock production related inputs.

3.17 Table 5 provides an estimate of the present and potential value of Kyrgyz pastures. The tables show that, with sound management, Kyrgyz rangelands could contribute an additional US\$100 million annually to the economy. This estimate, which is based on the best available information, illustrates the potential economic contribution of Kyrgyz pasturelands. It should be followed with more detailed analysis under the Sheep Development Project.

<b>Table 5a. Potential Annual Value of Rangeland and Mountain Pasture : Based on Poor Grassland Yields</b>									
	<b>HA</b>	<b>Average</b>	<b>Sheep/HA</b>	<b>Grazing time</b>	<b>Expected gain</b>		<b>Price</b>	<b>Value (million)</b>	
	<b>(x1000)*</b>	<b>Kg DM/HA</b>	<b>** / ***</b>	<b>(days)</b>	<b>(kg/day)</b>	<b>(kg/ha)</b>	<b>(som/kg/lw****)</b>	<b>som</b>	<b>US\$</b>
Spring	1,200	400	2.6	60	0.15	23	50	1,350	27
Summer	3,800	800	3.3	90	0.2	60	50	11,400	228
Autumn	1,200	400	2.6	60	0.1	15	50	900	18
Winter	2,000	150	1.5	150	0.05	11	50	1,125	23
<b>Total*****</b>	<b>8,200</b>			<b>360</b>				<b>14,7758</b>	<b>296</b>

\* = total grasslands are 9,200,000 HA but calculation assumes that currently 10% is unproductive.  
 \*\* = assuming a need of 80 kg/head/month during spring and summer when raising off-spring; 50 kg in winter.  
 \*\*\* = assuming that cattle, yaks and horses largely graze in summer but are largely dependent on fodder for the rest of the year.  
 \*\*\*\* = live weight.  
 \*\*\*\*\* = approx 200,000 ha meadow land is not included.

<b>Table 5b. As Table 5a but with Improved Grassland Yields</b>									
	<b>HA</b>	<b>Average</b>	<b>Sheep/HA</b>	<b>Grazing time</b>	<b>Expected gain</b>		<b>Price</b>	<b>Value (million)*</b>	
	<b>(x1000)</b>	<b>DM yield/HA</b>		<b>(days)</b>	<b>(kg/day)</b>	<b>(kg/ha)</b>	<b>(som/kg/lw)</b>	<b>som</b>	<b>US\$</b>
Spring	1,200	550	3.4	60	0.15	31	50	1,856	37
Summer	3,800	1,200	5.0	100	0.2	100	50	19,000	380
Autumn	1,200	550	3.4	60	0.1	21	50	1,238	25
Winter	2,000	250	2.5	140	0.05	18	50	1,750	35
<b>Total</b>	<b>8,200</b>			<b>360</b>				<b>23,844</b>	<b>477</b>

\* = Value & sheep stock in summer are not realistic as they are well over the maximum national flock, but pastures are too remote to use for hay.

**3.18 Increasing fodder production around fixed winter settlements.** One of the major constraints to improving livestock production and family incomes in the traditional transhumant systems is the lack of feed during winter and early spring, which reduces the number of animals that can be carried through the winter. The provision of small-scale irrigation systems has been useful elsewhere in the region<sup>5</sup> in increasing lucerne (*Medicago sativa*) yields, which is used for winter hay. This has improved food security and increased incomes. Proper drainage maintenance and efficient water management are crucial. Livestock pressure on transitional pastures will also need to be monitored carefully. Therefore sustainability is heavily dependent on a continuous and scrupulous management of the environmentally sensitive components of the project.

3.19 A system for the protection and rational usage of pastures is needed to address the problem of pasture degradation, and restore productivity. The main means for natural pasture improvement include:<sup>6</sup>

- ③ Use of optimal grazing loads, which will require monitoring and further training of rangeland users.
- ③ Pasture rotation, which could increase pasture capacity by 20-30 percent due to growth in productivity and improved species composition. The territory of the hilly and lowland pastures and non-steep slopes should be divided into permanent paddocks by hedges and other live or stone fences. In the more complex reliefs, fencing is not necessary where natural borders, such as bottoms of ravines, rivers, brooks, watersheds, groups of rocks, trees, etc., could be used as border marks for paddocks and pasture rotation areas. However, extremely erodable land should be excluded from use.
- ③ Control of noxious weeds (non-edible, dangerous and poisonous) and thorn bushes. An effective method against weeds on the lowland pastures and non-steep slopes is mowing of the weeds prior to seed set and after the grazing period. Grazing by goats and wildlife may also reduce weed development. Burning is often more detrimental than useful in the struggle against weeds.
- ③ Set aside vulnerable or over used areas and allow recuperation. Land with steep slopes should not be used (and may be fenced off with natural fencing) or only used for hay cutting.
- ③ Complementary over-seeding with appropriate grass or legume species.

3.20 With regard to forests, timber yields can be increased in localized areas in a sustainable manner, and increase incomes for the rural poor and generate revenues needed for forest protection and management (e.g., afforestation). This assessment was made in accessible forests receiving assistance under KIRFOR. For example, harvesting

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<sup>5</sup> For example for Kazak herders living in Altai Prefecture, in the northern Xinjiang Uygur Autonomous Region in China near the border with Kazakhstan and Mongolia. [Source: S. G. Reynolds 1998 Kazak herders, winter feed and transhumant systems in Altai Prefecture, Xinjiang, China. Paper Presented at the third meeting of the Temperate Asia Pasture and Fodder Working Group, 9-13 March 1998, Pokhara, Nepal.] or in Eastern Turkey (see box 3).

<sup>6</sup> Information provided by Ms. Ludmila Penkina, pasture management and grazing rights specialist, State Registration Agency

of spruce in selected regions could be increased from the current 0.25 m<sup>3</sup>/ha to 1 m<sup>3</sup>/ha without exceeding the annual growth increment. Data are not available to make an assessment of the opportunity or desirability of increasing timber harvesting in all forests of the Kyrgyz Republic. However, the prospects for economically viable wood production are small, and the priority should be on expanding the environmental functions of forest management, such as watershed protection.

3.21 There are also opportunities to increase incomes from NTFPs. Of the 90 different NTFPs identified in the area, the following were estimated to have national, regional and international market potential: walnuts, walnut and pistachio oils, honey, jams and juices of rosehip, sea buckthorn and *crataegus*, mushrooms, medicinal plants, and essential oils of certain medicinal and aromatic plants. The growth of the NTFP industry can be built on the home-based processing skills of the farm families now collecting and processing NTFPs for home consumption. A group of farmers could then pool their produce for joint marketing under one label. These groups could gradually evolve into producer and marketing groups or companies. The World Bank's Rural Credit project has shown that such a group approach is culturally acceptable and motivating for the resource-poor farmers to improve their livelihoods.

3.22 A potentially important income generating activity in the Kyrgyz Republic is nature-based tourism; the primary asset for tourism is the Republic's spectacular natural environment. Among the best-preserved and desirable tourism destinations are the protected areas (nature reserves and national parks). The Tien Shan mountains, which have been off-limits to foreigners for over 50 years and have a "last frontier" feel, represent a new and intriguing destination for international visitors.<sup>7</sup> The cultural traditions, historical identity with the Silk Road, and hospitality reinforce the tourism potential. The further development of nature based tourism is promising: this form of tourism, with a potential revenue of US\$15-20 million<sup>8</sup>, is already showing growth and does not depend on substantial improvements in infrastructure—one of the impediments to development of the tourism sector in general. There is an existing service sector and a growing demand for mountaineering and trekking and other forms of nature-based tourism (caving, skiing, river rafting, and wildlife observation). From 1996-98 the number of foreign tourists coming to the Republic for these reasons increased from approximately 5,000 to 9,000.

3.23 **Increasing investments.** A key challenge facing the sector is the lack of investment in the conservation and sustainable development of mountain rangelands and forests. State budgetary support for rangeland and forest management is below what is needed to improve productivity and ensure sustainability. These budgetary constraints are not likely to lessen in the coming years, and so further degradation of mountain

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<sup>7</sup> Tourism study for the Kyrgyz Republic. BDO Hospitality Consulting, 1996. 2 vols.

<sup>8</sup> From the Aga Khan/GTZ study "Kyrgyzstan Tourism Development Network" (2000) which noted growth potential for nomadic cultural- and "Silk Road" type tourism.

infrastructure and other inputs needed to improve natural resources management is likely (see Box 4).

#### **Box 4. The Argument for Private Sector Involvement in Forestry**

A key objective of the Government's forestry program is the protection of existing forests and the expansion of forest cover to improve environmental protection, and to increase wood supply and decrease dependence on wood imports.

With regard to afforestation, the specific target is to increase the forested area from the current level of 4.2 percent to 6 percent of the land area, an increase of 300,000 ha. Current forest practices in Kyrgyz Republic rely on plantation-raised seedlings for afforestation, which represents the main and most resource-consuming activity carried out by leshozes. The estimated annual cost (based on spruce plantations) for expanding plantation capacities to meet the target of 14,5000 ha/year is KGS 275 M (US\$0.94 M).

With regard to increasing wood production, the two main options are through:

- ③ *Afforestation.* The strategy of increasing afforestation to meet timber demand requires careful analysis because of the high costs required. Spruce plantations in the Issy-Kul Lake region are being established to produce high quality logs for import substitution. Fast growing poplar plantations are being established in lowland areas with the aim of producing fuelwood and low-grade construction wood.
- ③ *Promotion of farm forestry.* The option of promoting and financially supporting the expansion of farm forestry is attractive because some costs would be borne by the farmers, even though the potential for substantially increasing wood production is probably limited. Farmers plant trees, especially poplar, on their plots in small groups or lines in order to obtain fuelwood, construction wood, and wood for environmental services (windbreaks). Data on the extent of farm forestry are not available, but based on qualitative observations in the field, it is significant.

An economic analysis indicates that plantations of fast-growing poplars in good soils yield moderately high economic returns (FRR 13 percent, ERR 16 percent). The economic returns from a spruce plantation are low (FRR 5 percent, ERR 6 percent) mainly because of the long growth period (100 years). With respect to Government's goal to reduce dependence on imported wood, the most feasible strategy is to expand poplar plantations. However, even if all of the forest sector's current level of state funding were devoted to establishing poplar plantations, it would require some 20 years to establish them and another 20 years to cover 50 percent of the current demand. Therefore, it is infeasible that dependence on imports could be significantly reduced with Government funding only. The cost would be substantially reduced if the private sector could be involved in plantation activities and bear part of the establishment cost. Government support should therefore be limited to provision of financial and technical assistance to private investors interested in establishing fast-growing plantations.

The economic returns of spruce plantations are well below acceptable levels for productive investments. Because of the low returns, private investors are not likely to become involved in establishing commercial spruce plantations, and the Government would have to bear the full cost of establishment. It is therefore recommended that the present policy, namely that Government invest in protection plantations located in areas where erosion control or other specific environmental benefits are important, be continued.

3.24 Private sector involvement in mountain resource management is mainly through small-scale livestock business and experimental activities in the forest sector to engage local communities in economic activities. Although general constraints to private sector development in the country also apply to mountain development (e.g., non-transparent and burdensome regulatory environment and lack of access to credit), some specific obstacles include:

- ③ no opportunity for private sector involvement in harvest and transport of timber,
- ③ state subsidies for state enterprises in wood processing,
- ③ restrictions on access to resources.

#### **Box 5. Promoting Rural Livelihoods**

Mountain communities have poor access to education, advisory services, and assistance in improving their livelihoods. Given the poverty levels in the mountainous areas, and the downstream impacts of poor natural resource management there, the development of extension services and other support programs are a priority. These should promote social cohesion at the local level and sustainable natural resource use for subsistence and income generation.

Five internationally funded projects are underway in the region to promote rural livelihoods in the Central Asia mountain region:

- ③ The IDA/IFAD Sheep Development Project is piloting models of land tenure of mountainous rangelands on village/community (ayl akmotu) foothill pasture, to develop means to achieve long-term policies in rangeland use and monitoring. Under the pilot activities, the land is surveyed and divided into parcels for grazing and haymaking. Grazing is prohibited on steep slopes. The leasable land is divided into plots (200-400 hectares) for grazing of flocks of 200-500 sheep units—the minimal flock size for one family to make a fair living. The farmers receive technical assistance on rangeland management and forage improvement from specialists at the Rangeland Monitoring and Protection Unit of the Kyrgyz Land Management Institute (GYPROZEM).
- ③ The Swiss Agency for Development and Cooperation (SDC) is financing the Central Asia Mountain Partnership (CAMP), a program that supports the efforts of local institutions and individuals to improve the sustainability of mountain development. Three activities recently started under the first phase of this program are the promotion of yak husbandry, renewable energy and alternative energy solutions appropriate for the mountain context, and innovative ways (technologies, forms of organization, and products) to improve livelihoods in mountain populations.
- ③ The World Bank Central Asia Transboundary Biodiversity Project (see also Box 6) is promoting biodiversity conservation and rural livelihoods in villages around four protected areas in the West Tien Shan. The Small Grant Program under this project will finance community-based activities which promote biodiversity conservation, including sustainable use of natural resources (forests, pasture management, honey production) and alternative livelihoods (folk hotels for tourism).
- ③ The Rural Advisory and Development Service (RADS; a component of the IDA-financed Agricultural Support Services Project) is developing advisory services, and disseminating information through magazines and TV and radio programs. Food security programs and poverty programs in the agricultural sector focus on support to private farmers in the high potential areas and the institutions serving them, such as rural credit, extension, input supply, and agro-processing. The recipients/users of these services are largely from lowland agricultural communities who may use the high pastures seasonally.
- ③ The Asian Development Bank's Sustainable Mountain Development in Central Asia project is providing technical assistance to five Central Asia Republics to develop sustainable resource management systems in a regional context.

**3.25 Risk of biodiversity loss.** The conservation of Kyrgyz biodiversity is important both for its contribution to rural livelihoods and as a global good. This is particularly important because Kyrgyz biodiversity values are high, and they show a long-term declining trend over the last century as a result of overutilization of natural resources. Two complementary activities are needed to mitigate the risk of biodiversity loss:

- ③ The promotion of rural livelihoods is a necessary strategy for addressing the root causes of biodiversity degradation in the Kyrgyz mountains. The private hunting grounds now operating throughout the country, but mostly in the southern

mountain areas, provide an excellent opportunity to promote sustainable uses of wildlife and other natural resources. These hunting clubs have a good financial incentive for sustainable game management. However, large mammal populations migrate across many hunting territories, and therefore monitoring of annual trends needs to be coordinated at a national or landscape level. Ensuring that adequate annual or seasonal censuses are undertaken, analyses their trends, and monitoring compliance with national laws and regulations remains an important public sector function in wildlife management.

- ③ Biodiversity conservation needs to be mainstreamed more effectively into rangeland management and forestry. For forestry, this means addressing biodiversity conservation in the preparation and implementation of forest management plans, which are updated by the DoF periodically (e.g. 10 years). Currently, grazing plans or rangeland management plans are not prepared.
- ③ The system of protected areas (e.g. national parks and nature reserves) needs to be expanded and better financed to provide elevated protection to the highest priority areas. Currently, less than 2 percent of Kyrgyz forests are within protected areas, which is inadequate to sustain viable populations, especially those that require large home ranges or migrate seasonally inside and outside of protected areas. The protected area network should be expanded by creating new protected areas and increasing the area of existing ones. These protected areas can and should continue to play a role in regional development, by maintaining managed access to natural resources by local communities and promoting small-scale nature-tourism. With regard to financing their operations, weak state budget support for protected areas could turn these into ‘paper parks’—protected areas, which exist on paper but not on the ground. For this, the protected area communities should be allowed to collect fees from foreign visitors/tourists, develop other sources of revenue that are consistent with the biodiversity conservation and social objectives of the protected area, and be permitted to reinvest those revenues back into park management.

#### **Box 6. Transboundary Cooperation in the West Tien Shan**

The break up of the former Soviet Union (FSU) into independent republics and the worsening economic situation in the former republics has led to increasing pressure on natural resources, including increased hunting pressure. This increased exploitation of natural capital to optimize revenues and offset economic pressure has occurred simultaneously with a decline in law enforcement, and diminished institutional effectiveness and environmental monitoring. Three republics of Central Asia: Kazakhstan, Uzbekistan and the Kyrgyz Republic, inherited a protected area system model, which was common to the whole of the FSU and was once one of the best in the world. Now in Central Asia, as in Russia, economic difficulties and the strains of the transitional period have seriously undermined financing for nature conservation. At the same time, communities living adjacent to, or within, protected areas have increased their reliance on those areas' resources, especially through additional demands for pasture, fuelwood, arable land and game for immediate consumption or sale. The West Tien Shan region (including the Kara Tau range in Kazakhstan) is species-rich with some 3,000 recorded species of flora and fauna, 170 endemics, and many species that are threatened globally. The region covers a range of climatic conditions from sub-tropical to tundra and glaciers, covering semi-arid, walnut and conifer forests and mountain ecosystems. Characteristic mammals include snow leopard

(*Uncia uncia*), white-clawed bear (*Ursus arctos leucoryx*), Central Asian mountain goat (*Capra sibirica*) and argali (*Ovis ammon*). Rare and endangered birds include Eurasian eagle-owl (*Bubo bubo*), lammergeier (*Gypaetus barbatus*) and Himalayan griffon vulture (*Gyps himalayensis*). The area supports many useful plant species, including medicinal plants and more than 200 herbs, and is a centre of agrobiodiversity with wild relatives of grapes, tulips, fruit trees and pasture grasses. Many domesticated apple varieties originated in these mountains and the remaining wild relatives in the Tien Shan may offer potential for developing scab-resistant species.

The Central Asian Transboundary Biodiversity Project (WB/GEF, US\$10.15) is a three country initiative which will assist the governments of Uzbekistan, Kazakhstan and the Kyrgyz Republic to strengthen management in the protected areas of the West Tien Shan mountains and to encourage more sustainable land use management in the whole transborder region. Initially the project will focus in and around the zapovedniks of Besh-Aral, Sary-Chelek, Aksu-Dzhabagly and Chatkal and support protected area management and alternative livelihood activities to reduce pressure on these mountain ecosystems. In addition to national level activities, the project will support regional cooperation, focusing on joint planning efforts to designate wildlife corridors and appropriate land use to maintain the reserves as a linked protected area network. Joint training will be undertaken as well as joint research and monitoring of key wildlife species, especially of those predators and ungulates known to require large home ranges in these mountain habitats.

In the context of Central Asia, the goal of transboundary cooperation is assisted by the fact that all three countries share a common language (Russian) and have inherited a common protected area network framework as a legacy from the FSU. Joint planning, training and research activities are more cost effective and enable the three countries to adopt a realistic landscape approach to ecosystem management and biodiversity conservation and use. Such collaboration also allows the countries to jointly address complex social issues that impact on the region's human inhabitants as well as biodiversity. Overgrazing of mountain pastures in the Kyrgyz Republic for instance is associated with transhumance activities and seasonal herding of livestock from Uzbekistan for summer grazing, a practice that is neither ecologically nor economically sustainable. Although the West Tien Shan is not designated as a peace park, it is expected that the transboundary conservation efforts will further mutual cooperation and good will between the three countries. Already, a joint declaration of cooperation has been made for management of the transfrontier region.

3.26 There is an opportunity for protected areas to become more of an integral part of a national strategy for tourism development. If properly managed, this could contribute to the mission of protected areas by improving the livelihoods of communities around protected areas. The reserve directors, who have sufficient autonomy to interpret the rules based on practical considerations, now manage small-scale visitor use. However, realization of the potential of visitor use of the zapovedniks will require updating the current laws and regulations for zapovedniks. There are a number of related needs, such as developing:

- ③ human capacity to properly plan and manage tourism to ensure environmental sustainability;
- ③ transparent institutional and legal structures for managing revenue generated by the protected areas; and
- ③ a greater role of the private sector in assisting with tourism promotion of the Kyrgyz Republic.

## **IV. Conclusion and Summary of Recommendations**

4.1 The Kyrgyz Republic is working to develop its mountain development and natural resource management agenda, and on defining the role of the public sector for achieving these as well as the investment priorities. Table 6 summarizes the issues for range management and forestry with respect to the public sector and the users. There is an urgency to these issues. First, there are serious concerns over the high and growing cost of restoration and the irreversibility of some forms of damage (e.g. landslides and biodiversity loss). Second, opportunities are being missed to improve the livelihoods of local communities and reverse the cycle of poverty and natural resource degradation.

4.2 The main recommendation from the review is that Government should extend and deepen its efforts to improving access to resources and promote community-based grazing management and animal husbandry, which is now being piloted through the Sheep Development project and KIRFOR. The immediate challenges and opportunities for improved pasture management and forestry are as follows.

### **A. OPPORTUNITIES FOR IMPROVED PASTURE MANAGEMENT**

4.3 The key challenge for improved pasture management is improved access of people to rangeland resources. Options for improved management include:

- ③ Introduction of multi-year leases for pasture land, by individuals and associations, by local, rayon and oblast governments;
- ③ Introduction of provisions for sub-leasing and land transfer;
- ③ Improved access of livestock owners and associations to credit and advisory services, including for diversification of livestock production and utilization;
- ③ Training of range- and pasture managers, and establishment at local level of monitoring and quality control systems that ensure sustainable and equitable use;
- ③ “Scaling up” of the technical and organizational innovations being piloted under ongoing projects (in particular the IDA/IFAD-financed Sheep Development project). These include introduction of improved species composition for rangeland, continued pasture monitoring at local level, protection of vulnerable rangelands, pasture rotation, weed control, grass sowing, increased production of winter fodder, and improved animal husbandry;
- ③ Support for participatory natural resource management, whereby local communities undertake a range of technical improvements in livestock and arable land management and soil conservation, improving both incomes and sustainable watershed management.

## **B. OPPORTUNITIES FOR IMPROVED FOREST MANAGEMENT**

4.4 The key challenge for improved forest management is to improve sustainability and opportunities for rural livelihoods by moving from a forest management system, which is financed through production forestry, to forest management aimed at maximizing non-timber values. These include:

- ③ Supporting collaborative forest management approaches, including "scaling up" pilot programs supported by the Swiss government; this includes innovative arrangements for leasing of forests by local communities, which then manage harvests (including harvests of walnuts and other non-timber forest products) under an agreed management plan which includes replanting and afforestation;
- ③ Increased utilization and processing of non-timber forest products (walnut, rose-hips, mushrooms and medicinal plants);
- ③ Landscape management to encourage the potential for adventure tourism, and build on the present system of protected areas and ecosystems conservation supported by the ongoing GEF Central Asia Transboundary Biodiversity project;
- ③ Restructuring some forest districts (leshozes) which should not be managed for production forestry.

4.5 There are constraints to improved pasture and forest management in Kyrgyz Republic, but they are common to those faced in other countries with large numbers of rural poor dependent on mountain ecosystems. Participatory approaches to natural resource management can simultaneously increase incomes and reverse natural resource degradation, and have been successfully undertaken by poor rural communities with technical and financial support in Northwestern China, Turkey and Albania. Such programs also contribute to broader watershed protection.

4.6 Table 6 summarizes the key issues in mountain rangeland and forest management, and actions proposed to address them.

**Table 6: Summary of Issues, Constraints, and Proposed Actions for the Kyrgyz Mountain Rangeland and Forest Sector**

Issue	Constraint	Proposed Action
<b>Pasture Management (Institutions)</b>		
Well accepted and transparent rangeland and forest tenure is needed for sustainable resources use	③ Limited experience with leasing and oversight	③ Accept a tenure system of public ownership of pasture land, with long-term leasing and acceptance of public rights-of-way ③ Further revisions to the legal framework for pasture leases needed to improve transparency and protect private investors
Decentralized lease systems provide greater community participation and control	③ Stratification of pasture ownership and responsibility at local government level has begun but has not been completed  ③ Legal framework for pasture leases has been improved to allow long-term leases, but its implementation is not transparent and fair to all lessees, which leads to uncertainty and discourages long-term investment	③ Complete a system of stratification of rangeland ownership between <i>ayl akmotu</i> , rayon, oblast and central government ③ The ayl and rayon can lease to individuals, the oblast and central government to communities and village cooperatives ③ Develop/amend the necessary regulations at regional levels to formalize tenure system
Fragmented and weak institutional structure that assists users and institutions	③ Authorities have limited capacity to plan and supervise pasture management ③ A large number of institutions involved in pasture management	③ Provide training at university and technical school levels in rangeland management ③ Provide training and technical support to village councils and other relevant institutions Improve coordination between authorities administering pasture lands
Weak institutional structure that provides oversight over sustainable resources use	③ Fragmented institutions with opposing views	③ Streamline oversight, with emphasis on properly trained staff, decentralized system, and user input ③ Clarify responsibilities of State Registry with special attention to its consolidated functions
Weak checks and balances system to mitigate risk of unsustainable pasture uses	③ Akmotu and rayon staff are responsible for monitoring pasture uses and also rely on the fees generated for social programs	③ Strengthen monitoring and compliance enforcement role of State Registration Agency and Ministry of Environment and Natural Resources in ensuring that leases are implemented in accordance with pasture management regulations
<b>Pasture Management (Users)</b>		
Mobility is an integrated part of the grazing	③ Mobility is threatened to be restricted by land privatization (and the loss	③ Ascertain rights of way of flocks and herds during annual vertical migration € Develop a sustainable system in support of

Issue	Constraint	Proposed Action
system	of rights of way and other covenants) and by poor maintenance of essential infrastructure	essential infrastructure ③ Improve mechanisms of conflict resolution at the local level (e.g. by Elderly Councils or establishment of arbitration courts, whichever is more convenient and cost effective)
Concentration of village herds near areas leads to overgrazing and environmental degradation of village pasture	③ Lack of sufficient fodder production leads to excessive grazing in spring and fall ③ Individual subsistence farmers lack mobility (e.g. difficulties to arrange for shepherding)	③ Promote fodder production ③ Promote custom services by herder or herder groups in taking village animals out for summer grazing ③ Provide incentives for collaboration (e.g. adjust the available credit arrangements to favor group leases) ③ Provide extension agents to facilitate the organization of group leases for subsistence farmers
Subsistence farmers are unable to accept risk and forego immediate benefits	③ Restricted availability of investment funds for subsistence farmers ③ Lack of viable investment proposals	③ Increase credit funds available in mountain regions or reallocate existing funds in favor of mountain areas ③ Promote group leases (see above) in order to increase the size and financial viability of investments proposed by subsistence farmers
Breakdown of services (dipping, shearing, animal health)		③ Encourage public/private partnership in the maintenance of essential services in remote grazing lands
Rural livelihoods are overly dependent on pasture management	③ Inadequate legal framework to regulate access of private sector and farmers to alternative resources (ecotourism sites, NTFPs, land for fruit orchards) ③ Inadequate technical support for diversification	③ Improve legal framework securing access of the private sector to alternative resources and formulate clear guidelines for execution of strategy ③ Develop extension services to support all potential livelihoods in each given region
Lack of market access discourages investments and hinders productivity increases	③ Small supply volumes from individual farmers hinder access to existing marketing channels ③ Lack of marketing skills	③ Promote group marketing (as part of group lease arrangements—see above) ③ Provide necessary extension services
<b>Pasture Management (Land)</b>		
Degraded land should not be used for grazing	③ Land used is not differentiated well enough, and should be based on inventories and practical economic and environmental criteria Land prone to degradation	③ Develop land use system (and mapping) that differentiates land type ③ Pilot projects underway in four oblasts (Chui, Naryn, Issy-Kul, and Osh) to protect lands considered “risky” (high slope, degraded, landslide potential) from inappropriate uses (e.g. grazing versus haymaking) should be continued,

Issue	Constraint	Proposed Action
	is not excluded from risky use forms	then expanded to other areas based on the lessons learned ③ Initiate land improvement schemes based on watersheds
In degraded areas sedentary practices are rarely adopted even if environmental conditions would warrant it	③ Areas suitable for environmentally sustainable sedentary pastoralism are unidentified ③ Lack of technical skills and know-how ③ Lack of investment funds	③ Identify areas where sedentary livestock use is appropriate (i.e. where facilities exist to increase fodder production) ③ Monitor environmental sustainability of sedentarization ③ Provide necessary extension services ③ Expand credit lines (e.g. for irrigation, transport)
<b>Forest Management</b>		
Lack of financial resources seriously hampers forest management and restoration of degraded environments	③ Weak incentives for efficient leshoz administration ③ Inadequate revenue collection (e.g. sale of walnut burls) and financial management	③ Expand the pilots in leshoz administration reform, providing greater autonomy and financial incentives to improve forest management ③ Overhaul system of financial management at various levels of administration by introducing technical improvements and transparent procedures ③ Gradually increase payments for forestry resource uses
Inadequate basis for determining sustainable forestry (timber and non-timber forest products), and weak separation of commercial and regulatory functions at leshoz level	③ Inaccurate forest resource data hampers efforts to increase revenues from forest uses ③ Lack of budget support for both technical studies and regulatory functions, and forest management depends to a significant extent on leshozes' commercial activities	③ Carry out a national forest inventory in order to inform the opportunity for gradually increasing revenues ③ Strengthen regulatory oversight at the local level
Unsustainable uses of forests nears villages (timber and non-timber forest products)	③ Lack of practical alternatives for the growing subsistence-level reliance of local communities on forest resources	③ Develop community-based forestry activities in all leshozes, building on the pilot Collaborative Forest Management Program (CFMP)
Restoration of degraded lands is undertaken on a very modest scale	③ Heavy reliance on planting of forest species for restoration, with attendant high costs ③ In some areas there are no alternatives to the use of forest species, and there is little prospect for private	③ Expand and deepen the CFMP enabling farmers to pay the lease fees as in-kind contributions to afforestation ③ Concentrate afforestation in areas where environmental benefits (e.g. erosion control) are significant and important ③ Promote natural regeneration by closing off areas (e.g. degraded gorges) for appropriate

Issue	Constraint	Proposed Action
	sector involvement (poor infrastructure, remoteness etc.)	periods (seasonal to multi-annual) ③ Identify areas suitable for establishing fruit trees and lease them to the private sector ③ Promote farm forestry by providing seedlings at favorable prices (e.g. poplars) ③ Consider introduction of lower cost options for restoration of vegetation cover, such as grasses and shrubs
Expansion of lease arrangements is hampered by inadequate and unclear legal framework	③ The strong position of leshozes vis-à-vis local people and lack of written regulations makes the negotiation process non-transparent and unbalanced ③ Citizens and communities are reluctant to use the court system for conflict resolution	③ Improve the model contracts under the CFMP, educate the leshoz staff and potential lessees, and monitor compliance with regulations ③ Ensure that the selection criteria provides the poorest groups equal access to lease agreements ③ Improve mechanisms for conflict resolution at the local level with the view to ensuring their neutrality (e.g. CFM Boards or Elderly council)
<b>Non-timber Forest Products (NTFPs)</b>		
A considerable portion of the income generation potential of the NTFPs remains unused	③ Lack of markets for NTFPs leaves a considerable portion of the potential harvest unused ③ Lack of processing capacity inhibits generation of value-added	③ Provide technical support to development of industries based on home-based processing skills of farm families ③ Provide extension services to facilitate organization of joint marketing ③ Simplify/streamline leasing procedures and requirements for private sector (local communities and entrepreneurs) access to NTFPs
<b>Wildlife</b>		
Inadequate incentives for protection of wildlife, resulting in population declines of some species	③ high unemployment and poverty in mountain communities and weak alternative incentives for conservation	③ maintain leasing opportunities for private hunting grounds, but reduce conflicts with leaseholds for livestock uses ③ develop transparent monitoring and reporting function on game species population trends and trophy hunting licenses
<b>Nature-based Tourism</b>		
The income generating potential of nature-based tourism is largely unused	③ Lack of investment in tourism infrastructure and marketing ③ Legal framework inhibits the participation of private sector in tourism promotion	③ Create enabling legal framework for private sector involvement in tourism (infrastructure and services) in the mountains through long-term leases and development of concession arrangements. ③ Better define the role/mandates of the different types of protected areas in the Kyrgyz Republic in the tourism sector, and update legislation accordingly.

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