Pastoralists and Predators in Alai: Political Ecology of Wildlife Management in Kyrgyzstan

Dissertation
zur Erlangung des Grades eines
Doktors der Naturwissenschaften (Dr. rer. nat.)

am Fachbereich Geowissenschaften
der Freie Universität Berlin

vorgelegt von
Maksatbek Anarbaev

Berlin, 2021

Gutachter

Betreuer der Dissertation und erster Gutachter:

Prof. Dr. Hermann Kreutzmann
ZELF Geographische Entwicklungsforschung
Institut für Geographische Wissenschaften
Freie Universität Berlin
Malteserstr. 74-100, Gebäude K
12249 Berlin

Zweiter Gutachter:

PD Dr. Stefan Schütte
Fachrichtung Humangeographie
Institut für Geographische Wissenschaften
Freie Universität Berlin
Malteserstr. 74-100, Gebäude K
12249 Berlin

Declaration of Independence

Herewith I certify that I have prepared and written my thesis independently and that I have not used any sources and aids other than those indicated by me. I hereby confirm that the present doctoral thesis has not been filed anywhere before.

Tag der Disputation: 06.12.2021

This study carried out at the Centre for Development Studies of the Institute of Geographical Sciences at Freie Universität Berlin and funded by the German Academic Exchange Service – Deutscher Akademischer Austauschdienst (DAAD)

Dedicated to my family and to the people of Alai

Content

Acknowledgements

Writing the dissertation would have been impossible without the help and support of many people. First of all, I am grateful to my leading scientific supervisor Prof. Dr. Hermann Kreutzmann, for his valued coaching, kind support, sound comments that has been crucial in creating this thesis and for guiding me throughout the process.

Much was learned from Prof. Dr. Matthias Schmidt, PD Dr. Stefan Schütte and Dr. Andrei Dörre, and I would like to express my gratitude for their support, advice and comments that helped to make this work possible. I want to thank very much Prof. Dr. Ian Hannam for his continuous kind help in editing, encouragement and sound advice that has been pivotal in refining this thesis.

I am very grateful to Dr. Munavar Zhumanova for her kind assistance and sharing with the archival materials. Special thanks I owe to my long-time Japanese colleagues and mentors Prof. Dr. Shigeyuki Izumiyama and Prof. Dr. Teiji Watanabe for their all support and helping to make my initial fieldwork in the Alai Valley. I want to say tremendous thanks to Dr. Tanya Rosen for her timely assistance and contribution to conduct the fieldwork on wildlife research in Kyrgyzstan.

Many people at the Freie University Berlin have been colleagues and friends, therefore a huge gratitude to Bernd Hilberer, Mohammad Kittaneh, Mayinu Shanatibieke, Tobias Kraudzun, Lavinia Mawlong, Lira Sagynbekova, Marina Heyink, Rune Stenberg, Lamis Al-Haseed and Michael Spies, for their shared time and support.

Tremendous thanks to Academician Asylbek Aidaraliev and Prof. Dr. Kulubek Bokonbaev, who shared their knowledge and experience, and provided valuable research assistance in Kyrgyzstan. I want to thank the people of the Alai Valley, officials, experts and social activists who made themselves available and answered my numerous questions.

Huge thanks to my friends Jörg and Viktoria Kim-Boese, Rena and Helmut Adwiraah, Sabine Grascht, Manas Kadyrbaev, Akzhol Dzhenaliev, Bakhtiyar Edilbekov, Kanat Moldokulov, Sasha and Eugenia Savushkiny, Rolf Nessing and his family who made our stay in Germany full of joy and with a friendly atmosphere. A huge thank you to my friend Ivan Patrakov for his kind assistance. Finally, I want to thank my family and relatives, without their patience, unconditional love and support I would not be where I am today.

Summary

The study is devoted to the human-environmental relationships in the post-socialist period of Kyrgyzstan. It addresses the human-wildlife conflicts using the example of the Alai Valley in the south of the country. Environmental and climatic characteristics of this highland valley provide suitable conditions for pastoralism and serve as habitat for wildlife. In recent decades, the natural landscape of the region came under increasing international attention with regard to nature conservation, sustainable land management and development projects.

Historically, pastoralism has played a significant role for the economy of Kyrgyzstan. Following the dissolution of the Soviet Union, the collapse of state agricultural infrastructure facilities, veterinary care, loss of markets, and privatisation of the agricultural sector of the economy and other factors have led to a major downfall in the animal husbandry industry. The number of sheep and goats decreased from ten million in 1990 to four million in 2000. Nevertheless, pastoralism has considerable importance to the national economy and remains as the crucial income source for rural livelihoods in Kyrgyzstan.

The post-socialist period of Kyrgyzstan has faced rapid socio-economic and political transformation which has resulted in changes not only to local livelihoods, but also in livestock husbandry, nature protection and wildlife management.

In recent decades many pastoralists often complain about the increase in livestock depredation by wild predators. It is taking place despite the presence of state sponsored predator-control activity. From another side, there are public concerns about wildlife conservation. With the engagement of many environmental NGOs and mass-media, wildlife management issues have quickly become highly politicised in Kyrgyzstan. Becoming a Party to several global environmental conventions has increased the realisation of many projects funded by external donor organisations, and the implementation of their obligations for wildlife conservation, together, have substantially raised the profile of wildlife management in Kyrgyzstan at the international level.

Moreover, since the independence of Kyrgyzstan, the territory of Protected Areas has increased by three times. Protected Areas are crucial to wildlife conservation and are promoted by the nature conservation community as a beneficial measure to the mitigation of human-wildlife conflicts. Despite this fact, livestock depredation by wild predators generates conflicts and has become a serious conservation issue.

The study aims to better understand human-wildlife interrelationships in connection with pastoralism, protected areas and wildlife management in Kyrgyzstan. Wildlife related conflicts

are analysed to determine the status of livestock depredation and to explore its linkages with rural livelihoods and wildlife conservation concerns in the Republic. The project design emphasises different utilisation strategies for the same area of rangelands, including the provision of fodder resources, wildlife habitat area, livestock grazing, and other uses by humans. Additionally, the focus of this study is directed towards a historical aspect of the region in relation to the development processes in the Alai Valley and use of its natural resources.

1 Introduction

Kyrgyzstan is a mountainous republic of 200,000 km^2 that is located in the heart of Central Asia. It was previously part of the Soviet Union and declared its independence on 31 August 1991. By 2018, the population of the country had reached over six million with a rural population of 66% (NatStatCom, 2019:28). The majority of the territory is part of the Tien-Shan and Pamir-Alai Mountain systems with the highest peaks over 7,000 meters above sea level. These mountain ecosystems are characterised by a high level of species richness, rarity of habitats and endemism[1] (Ministry of Environmental Protection, 1998:21). Furthermore, the mountains of Central Asia are listed in the Global 200 ecoregions as a priority for global conservation (Olson and Dinerstein, 2002:208) and are referred to as 'Biodiversity Hotspots' by Conservation International (2005). Moreover, due to altitude and climatic features, these mountain ecosystems are suitable for pastoralism (Kreutzmann, 2011:40). In Kyrgyzstan, the land suited to agriculture occupies 10.6 million hectares or 53% of the country's territory, where the dominant portion of the land is pastures occupying 9.2 million hectares (Minagro, 2016). Historically the highland pastures have been used for pastoralism and serve as habitat for wildlife.

Since the dissolution of the Soviet Union on 26 December 1991, post-socialist Kyrgyzstan has faced rapid socio-economic and political transformation which has resulted in changes not only to local livelihoods, but also in livestock husbandry, nature protection and wildlife management. The rules and regulations in pastoralism have been amended in recent times and subjected to new legislation. Nature protection and pasture management follow different rationales and the outcome of the new legislative procedures is a reflection of adherence to national impacts and in compliance with international rules.

1.1 Global nature conservation agenda

The attention and concern for biodiversity conservation, particularly larger wild species has grown enormously since the turn of the twentieth century (Groombridge and Jenkins, 2002:195). The global attention for human interaction with the environment started with the Conference under patronage of the United Nations on the Human Environment, also known as the Stockholm Conference, held in 1972. This event is considered the first major international conference of the United Nations where environmental issues were addressed and was a turning point in the

[1] Endemic is a native species or race that is confined to a particular region or country (Ministry of Environmental Protection, 1998:112)

development of global environmental policy (United Nations, 2016). Later in the 1980s and the early 1990s several international agreements on wild species and habitat conservation entered into force and the term of 'biodiversity' was elaborated (Escobar, 1998:56) (Box 1.1). Historically, this environmental discourse had its roots at the end of the eighteenth century in relation to the *Romanticism* in Europe and *Wilderness* movements in North America. These philosophical movements were highly influenced by painters and writers (Brooks, 2014:36). They highlighted the 'beauty of natural scenery' and were looking for 'primeval beauty', 'untouched forest' and 'virgin landscapes' (Ives and Barker, 2000:118). During the nineteenth and twentieth centuries, this appreciation of nature contributed to and stimulated the establishment of nature reserves and national parks, and spread to other parts of the world (Davis, 2015:266; Mathieu, 2011:124). The concept of protected areas was pioneered with the establishment of the Yellow Stone National Park in the United States of America in 1872 (Kharel, 1997:127).

Box 1.1 Definition of biodiversity

The term 'biodiversity' is comparatively new, coined as a contraction of the words 'biological diversity' in 1985 and since then became popular in use among practitioners and within the academic community (Wilson, 1988). According to the United Nation Environment Programme (UNEP), biodiversity is the variety of life on Earth, it includes all organisms, species, and populations; the genetic variation among these; and their complex assemblages of communities and ecosystems (Pimpare, 2015:9).

Initially environmentalism became a popular movement within industrialised countries in the 1960s and 1970s. This ideology had many dimensions and specific concerns about pollution caused by industry, and the debate around the depletion of natural resources, which resulted in the development of the term 'sustainable development'. Within the scope of nature, the primary concern was wildlife (Box 1.2). The growth in enthusiasm for nature conservation of that time can be seen from the rapid growth of the combined membership in various unions, especially in Europe. This movement gave new impulse for many international organisations such as the Fauna and Flora International (FFI founded in 1903), the International Union for Conservation of Nature (IUCN was established in 1948), World Wide Fund for Nature (WWF founded in 1961), Friends of the Earth (founded in 1971), the Greenpeace (founded in 1977 in the United Kingdom) and others, which are nowadays playing a significant role and influence the global conservation agenda (Adams, 2004:61).

Box 1.2 Definition of wildlife

The word 'wild' has several meanings and sometimes characterizes a person or animal that behaves unpredictable or uncontrollable. To avoid confusion over the different uses of 'wild', the term 'free-ranging animals' is often used in the academic community (Conover, 2002:1). Moreover, not all free-ranging animals are referred to as wildlife. Further, some scholars argue that wildlife includes all non-domesticated plants, animals, and other organisms (Harris and Brown, 2009). Traditionally, insects, fish and other invertebrates are not covered under this term. Historically, only free-ranging vertebrates are considered as wildlife. Within this thesis, the term wildlife is used as it is the commonly accepted definition according to Conover (2002:2) which means free-ranging mammals 'whose behaviour and movements are not controlled by humans'.

Up to now these pioneering and earlier established international non-governmental organisations, are nowadays implementing many projects in biodiversity conservation and are widely recognised by many countries for this work. Many of them aim to draw attention to biodiversity conservation, influence national and international policy and decision-making, and provide information to guide actions and other activities at various scales. Among them, a special role is given to membership organisations such as the International Union for Conservation of Nature (IUCN) which is closely associated with UN agencies and many other organisations. The Union was established in 1948 and across a wide range of themes related to nature conservation and sustainable use of natural resources as well as advocacy and education. The scope of interests covering biodiversity, climate change, water, ecosystem management, environmental law, forest, protected areas, global policy and other interrelated topics[2]. Furthermore, this organisation regularly produces the inventory of conservation status[3] of biological species and assesses the risk of extinction, widely known to the public as IUCN Red List of Threatened Species which is used as a guideline for wildlife conservation by many organisations and states, as well as a tool for generating funds towards protection.

In 1966, the chairman of the IUCN Commission on Protected Areas and on Species Survival (SSC), Sir Peter Scott, initiated the Red Data Book approach. This initiative quickly spread and was supported by many countries. The main objective was to document, provide scientific information, draw attention, influence national and international policy and assess the status of

[2] See www.iucn.org/theme

[3] There are nine classifications: Not Evaluated (NE), Data Deficient (DD), Least Concern (LC), Near Threatened (NT), Vulnerable (VU), Endangered (EN), Critically Endangered (CR), Extinct in the World (EW) and Extinct (EX).

species under risk of extinction. At the same time, many countries produced their own national 'Red List' for the administrative territory of the country (Groombridge and Jenkins, 2002:197). For instance, "The Red Book of the USSR" was established in 1974 with the first edition being published in 1978. That year the Soviet Union hosted the 14th IUCN General Assembly in Ashgabat, the capital city of Turkmenistan.

The Earth is home for an assemblage of millions of exclusive species. The biological diversity and complexity of species within the biosphere is an essential component of the life-supporting ecosystems on Earth and it is widely acknowledged by modern science. Living organisms and their ecological inter-relationship is a main feature of the environment. The changes in ecological balance or extinction of any species may alter this delicate interconnection and result in threats to other species, ecosystems, and to humans as well (Ministry of Environmental Protection, 1998:10). In this perspective the role and functions of the mountain ecosystems are crucial.

Special attention to the mountain environment was a feature of the 1992 World Earth Summit, which took place in Rio de Janeiro. Chapter 13 of Agenda 21, which was a major outcome of the Summit, was devoted to 'Protecting Fragile Ecosystems: Sustainable Mountain Development'. Later the UN General Assembly at its fifty-third session adopted resolution 53/24, which supported the initiative of Kyrgyzstan and announced 2002 as the International Year of the Mountains, which was concluded with a final high political level meeting in Bishkek (Mathieu, 2011:151; Schmidt, 2008:141). Undoubtedly, these events significantly contributed to the awareness of the important and global role played by mountains, socioeconomically and within the global biophysical system (Grabherr and Messeli, 2011:8). In this regard, the UN General Assembly adopted several resolutions on the subject of 'Sustainable Mountain Development' and encouraged governments, non-governmental organisations, international donor institutions, relevant agencies of the United Nations system to financially support mountainous countries.

1.2 Mountain regions as biodiversity hotspots, human habitat and protected areas

> Mountains are fragile ecosystems and globally important as water towers of the earth, repositories of rich biological diversity…
> (Mathieu, 2011:152)

It is widely recognised that biodiversity plays a vital function and provides a variety of benefits to humans, including from a food source, medicine, fuel, physical protection, and religious, aesthetic and spiritual pleasure. However, at the beginning of the twenty-first century the world is experiencing dramatically high rates of biodiversity loss. Moreover, the present time is

characterised as 'the great [biodiversity] extinction episode in geological history' (Helm and Hepburn, 2012:2). However, while some species are endangered and at risk of extinction, some species thrive in human dominated habitats (Woodroffe et al. 2005).

The place and importance of mountain regions in biodiversity conservation is widely emphasised and globally recognised. Mountain environments cover around 27% of the Earth's land surface and provide a wide range of goods and services. This includes energy, timber, and opportunities for recreation, spiritual renewal and ecosystem maintenance (UNEP World Conservation Monitoring Centre, 2002:8).

Alongside with providing habitat for plant and animal species and a variety of biodiversity, mountain regions are home for 22% of the human population of the Earth. At the same time, mountain territories provide freshwater to over half the global human population (Jansky, 2002:29; Juffe-Bignoli et al. 2014). According to an estimation made by FAO for the UN International Year of Mountains, the human population has almost doubled since 2002 (Grabherr and Messerli, 2011:8). Three-dimensional features, climatic characteristics and relief of the mountains, provide a variety of environmental conditions (Mathieu, 2011). Accordingly, from the perspective of biodiversity conservation that makes them very important. Due to their relative inaccessibility and low level of habitat overlap with humans, many endangered wild species find shelter in mountain environments.

In terms of climate, geology, human culture, flora and fauna, every mountain environment is unique (Grabherr and Messerli, 2011:9). They support approximately 25% of terrestrial biodiversity as well as vital genetic resources (FAO, 2015). Therefore, in the context of nature protection, mountain regions are key regions for wildlife conservation. Helm and Hepburn (2012:1) argue that the 'remaining biodiversity' is living dominantly in developing countries. Most of these developing states are mountainous and comparatively young countries (Kreutzmann, 1995:214) where the majority of the mountain population rely on a rural livelihood (Gentle and Thaites, 2016:173; Huddleston et al. 2003:4; Rodríguez- Rodríguez and Bomhard, 2012:197). For a variety of reasons many people make a living from the mountains or are forced to live in these 'fragile' areas and for many of them pastoralism is their principal income source.

A major role of the concept of nature conservation, as well as adapting to and mitigating the impacts of climate change, is the establishment of protected areas (Jackson et al. 1996; Zisenis et al. 2010). Over the past several decades the global coverage of protected areas has increased rapidly. In 2014 the UNEPs World Conservation Monitoring Centre (WCMC), in collaboration with IUCN, reported that more than fifteen percent of terrestrial and inland water areas are now

under protection. Despite their global extent, and the distribution and improvement in the management of protected areas, the loss of global biodiversity is ongoing (Juffe-Bignoli et al. 2014). According to the WWF Living Planet Report (2018), which was prepared in cooperation with the Zoological Society of London, there has been a decrease in biodiversity at an alarming rate over the last 40 years. The latest Living Planet Index shows an overall decline of 60% in the size of the populations of species between 1970 and 2014.

In the context of biodiversity conservation, mountain regions have received special attention by the international community. Historically, mountain areas played a role in nature conservation as the first protected areas in the world. Initially national parks were mostly associated with mountains or romantic elements of mountain features such as rivers, forests, canyons, waterfalls and other picturesque components. Only later, after the Second World War, because of the expansion of conservation knowledge and policies, areas such as wetlands, coastlines and mangrove forests were also designated as protected areas (Cronon, 1995:73; Mathieu, 2011:126).

The general concept of a protected area is understood as being areas where human activities, access rights or at least the use of resources is limited. In some cases, for instance in terms of the Soviet concept – *zapovednaya territoriya*[4] human activities are totally forbidden, except in conjunction with scientific research work (Shtilmark, 2005:42-43). The history of nature conservation provides several cases when indigenous people were removed from their traditional lands or suffered limited access to their resources. Therefore, the establishment of new conservation areas was not always supported by local inhabitants, especially when their primary lifestyle was highly dependent on the natural resources of the territory.

Since the twentieth century, biodiversity conservation became a ground of concern and debate in society, which facilitated the establishment of many international organisations working at various levels and locations over the world. Many national governments recognise the importance of nature conservation and have developed national legal and institutional frameworks for biodiversity conservation to manage a network of protected areas. Almost all countries have a special governmental body which is responsible for environmental protection.

The various types of conservation areas within different countries challenged the international community to reach consensus on the categorisation of protected areas and led to the adoption of a standard definition for protected areas. The specific characteristics of protected areas, such

[4] The term originates from the Russian word *zapoved,* meaning *precept.*

as their primary objectives, level of access and resource exploitation by humans and other features are reflected in the categorisation process (Lausche, 2011). The International Union for the Conservation of Nature (IUCN) has taken a leading role in protected are management and has developed a globally accepted categorisation and governance guidelines for protected areas. According to the IUCN, a protected area is "a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values" (Dudley, 2008:8). Protected areas can be in many different forms, such as national parks, wilderness areas, community-based conservation areas, wildlife sanctuaries, nature reserves and privately-owned reserves.

The coverage of protected areas in the world did not change between 1930 and the 1960s. However, since then there has been a rapid increase of protected areas (Table 1.1). By 2016, the total coverage of protected areas had reached around 20 million km^2 where around 20% of the world's mountain regions were designated as protected areas (Juffe-Bignoli et al. 2014:46; UNEP-WCMC and IUCN, 2016:30). In accordance with the World Database on Protected Areas (WDPA) the overall protected area in 2016 has fallen compared to 2014, because of changes in size of PAs, or some areas no longer qualify for inclusion in the dataset. Nevertheless, the Global Protected Area Network continues to grow.

Table 1.1 Overall coverage of terrestrial and inland water protected areas in the world

	Number of Protected Areas	Protected Areas in million km^2	Share in global land surface
1962	1,000	4.4	3.0%
1990		12.3	8.4%
2005		16.3	11.1%
2014	209,000	20.6	15.4% of the world's terrestrial and inland water areas are covered by protected areas.
2016	202,467	19.8	14.7% of the world's terrestrial and inland water areas are covered by protected areas (excluding Antarctica).
By 2020*		25.0	at least 17% of terrestrial and inland water areas. *According to Aichi targets within the Convention on Biological Diversity (CBD)

Source: Compilation based on Kollmair et al. (2005:185); UNEP-WCMC and IUCN (2016:30); Juffe-Bignoli et al. (2014:8)

The expansion of agriculture is considered as one of the largest impacts on the wildlife (Ritchie and Roser, 2020). According to the FAO (2019), globally around 15 million km^2 or 11% of the land surface is used in crop production (arable land and land under permanent crops). Whereas the terrestrial and inland water areas designated as protected areas covered a surface area of 19.8

million km^2, which is equivalent to 14.7% of the global land surface (UNEP-WCMC and IUCN, 2016). This area already exceeds the available global size of arable land. It is strongly believed that the increase of protected areas will mitigate biodiversity loss (Juffe-Bignoli et al. 2014). Despite the fact that the area of protected areas in the world has increased, the trend of extinction rate of plant and animal species is still very high (Kearns, 2010). For instance, the Turan or Caspian tiger (*Panthera tigris ssp. virgata*) is believed to be extinct from Central Asia. It is known that in 1956, the tiger was shot in the south of Tajikistan (Sokolov, 1986:348) and the last record of appearance in the wild was in the early 1970s (Jackson and Nowell, 2011). Almost no data or recent confirmed records have been reported regarding the Dhole (*Cuon alpinus*)[5] which has disappeared from most of its historical habitat range including the Tien-Shan and the Pamir-Alai Mountains (Kamler et al. 2015).

The term wildlife was originally used exclusively for large or visible animals. However, since last century the term referred to a wider variety of animal species. Besides the vital functions of biodiversity within ecosystems, wild species are valued by humans in many contexts and situations. More recently, the scope of conservation has grown, from its origins of wildlife conservation for game hunting, to the conservation of all form of life (Western and Waithaka, 2005:357).

Many publications have served to raise the international attention to the fragility and vulnerability of mountain ecosystems that face complex and rapid changes. The main pressures on mountain biodiversity are seen as changes in land use, mining and development projects, and climate change (Zisenis et al. 2010:8). In this context, climate change is considered a severe consequence for vulnerable mountain ecosystems supporting rich biodiversity heritage. Climate change is also threatening human livelihoods, causing or triggering natural hazards, and is impacting on the ecosystem services of mountains. As a result, the role of protected areas in mountain territories has gained more attention. Currently, many parts of the mountain regions of the world are protected areas and this coverage is increasing (Rodríguez-Rodríguez and Bomhard, 2011:25).

Historically the perception of mountains was varied but changed over time, alongside with the progression of science, geopolitics, and development of society. From being – sacred, holy, barren, magnificent, fearsome, shelter, barrier, backward, periphery, frontier, as well as a source

[5] In both Russian and Kyrgyz languages, the name of this species translates verbatim the red wolf. *Krasnyi volk* and *Kyzyl karyshkyr* accordingly.

of beauty and inspiration to mankind (Brooks, 2014; Haugen, 2003; Kreutzmann and Watanabe, 2016; Mathieu, 2011).

Along with other mountain regions, the mountains of Central Asia encompass fragile ecosystems as well as beautiful landscapes, providing habitat for a unique diversity of species and include a number of "biodiversity hotspots[6]" (Conservation International, 2005; Hanson et al. 2009:580; Wagner et al. 2016:3). Mountain dominated landscapes are one of the key habitats for a unique assemblage of flora and fauna representing the Central Asian region. Because of their geographic location within the Asian continent the Central Asian mountains play a crucial bridging role in the distribution of mountain biodiversity (UNEP-GEF, 2009:11). These territories are habitat for rare and iconic large mammals such as snow leopard *(Panthera uncia)* (Fig. 1.1), brown bear *(Ursus arctos isabellinus[7])*, Turkestan lynx *(Lynx lynx isabellinus)*, wolf *(Canis lupus)* and their natural prey species, the argali *(Ovis ammon)*, Siberian ibex *(Capra sibirica)*, Tien-Shan wapiti – maral *(Cervus canadensis)*, roe deer (*Capreolus pygargus*), various kinds of marmots *(Marmota menzbieri, M. caudata, M. baibacina),* stone marten (*Martes foina),* Eurasian badger (*Meles meles)*, tolai hare *(Lepus tolai)* and others (Izumiyama et al. 2009:16). For instance, the very specific cape hare species *(Lepus capensis pamirensis)* is found only in the highlands of the Pamirs (Shan and Liu, 2016:4572). Traditionally humans directly used many of these animals for in their subsistence lifestyle, as well as for pelt, fur and more recently as international trophy-game species.

International environmental organisations claim that the population of wild predators is declining at a disturbing rate. This is occurring due to the loss of habitat and prey, conflict with humans, poaching and illegal trade. Therefore, on 23 October 2013 the representatives of international donor organisations and political leaders in the governments of all twelve snow leopard range countries[8] came together in Kyrgyzstan and adopted the Bishkek Declaration on the Conservation of the Snow Leopard.

[6] The idea of 'biodiversity hotspots' was developed by ecologist Norman Myers in 1988. Later Conservation International used the concept to identify and give a priority for particular 'regions of the world to address biodiversity loss and to guide investments in conservation' (Mittermeier et al. 2011:3).

[7] Classical bibliographer Elliott Coues enjoyed tracing the Greek or Latin names to give the taxonomic classification of subspecies in ornithology and mammalogy. The legend says that Lady Isabel, having confidence in her husband's prowess, promised not to change her chemise until he conquers the next town. It was much longer than she expected, and she wore the garment until it assumed a peculiar brown colour, hence where the term 'Isabel-colour' originates from (Brooks, 2014:137). Accordingly, many wildlife and birds characterised as brown species received annex *isabellinus* in their Latin names.

[8] The Snow leopard habitat range includes twelve countries – Afghanistan, Bhutan, China, India, Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, Russia, Tajikistan and Uzbekistan.

Figure 1.1 The first image of an iconic female snow leopard in the territory of the Naryn State Nature Reserve of Kyrgyzstan in 2014
Source: Image taken from the sensor camera of the Kaiberen Wildlife Research and Conservation Program

This date is recognised globally and is celebrated annually as International Snow Leopard Day. The Governments of 'habitat range countries', with the support of international agencies and NGOs, launched the Global Snow Leopard and Ecosystem Protection Program, known as GSLEP. This joint initiative has the goal to secure the long-term survival of the snow leopard in its natural ecosystem and have pledged to secure 'Twenty Snow Leopard Landscapes' by 2020. In 2018, to promote the importance of the snow leopard in the ecosystem and the protection of the world's big cat species, the UN World Wildlife Day – the 3rd of March was celebrated under the topic 'Big Cats: Predators Under Threat'.

Mountain regions provide ecosystem services for their human occupants and for those in downstream areas, as the mountains are considered as the water towers of Central Asia. Mountain glaciers play a crucial role in the hydrological cycle and fresh water supply for the arid zones of the entire region. Mountain ranges also provide the freshwater runoff widely used for agricultural irrigation and household consumption (Sorg et al. 2012:725).

The altitude and climatic features of the mountain areas create environmental conditions suitable for pastoralism (Kreutzmann, 2011:40). Mountains of Central Asia are also known as the center of origin of many domesticated crops and animals (Maikhuri et al. 2015), identified as the important areas of plant diversity at a regional and global scale (Groombridge and Jerkins,

2002:202). In particular pastoralism has a long history and tradition in Central Asia. For instance, recent archaeological surveys have established that the Alai Valley of Kyrgyzstan has been used for pastoralism since the early Bronze Age (Taylor et al. 2018).

A number of publications highlight that among the wildlife associated issues, animal husbandry is facing conflicts more often and this is mostly because of depredation on livestock by wild predators (Lescureux and Linnell, 2013:7; Peterson et al. 2010:76; Thirgood et al. 2005:17). Livestock depredation remains a major challenge facing wildlife conservation today (Ogada, 2015:329). Human-wildlife conflict (HWC) is globally recognised as a severe problem that is challenging nature conservation (FAO, 2009). Conflicts between humans and wildlife covers a diversity of species and situations, including grain storage damage by rodents, crop destruction by elephants and macaques, to tiger attack on humans (Dickman, 2010:458).

The IUCN World Parks Congress (WPC) has brought human-wildlife conflict problems into the main agenda of global biodiversity conservation and is devoted to addressing the challenges that face wildlife conservation and protected areas. The WPC is a global event, which takes place every decade, with participation of decision makers, experts and protected area practitioners from over the world. The main purpose is to share information and formulate the global policy agenda for protected areas. In 2003, the 5th WPC Congress which took place in Durban, South Africa, included the key workshop entitled "Creating Coexistence Between Humans and Wildlife: Global Perspectives on Local Efforts to Address Human-Wildlife Conflict" (Madden, 2004:247). Besides the discussions of how conservationists, biologists and other practitioners should address human-wildlife conflicts, the primary output of the congress was a clearer understanding of this problem. Since 2003, awareness of human-wildlife conflicts has gained popularity in the field of conservation biology but also in social science as well. For instance, by applying the keywords 'human-wildlife conflict', the search engine of *ScienceDirect* provided results of up to 1,400 published papers especially since the 2003 Durban congress (Fig. 1.2).

The search results showed that, primarily, the human - wildlife interrelations came under focus of the peer-reviewed journal *Biological Conservation*. The journal was first published in 1968 and affiliated with the Society for Conservation Biology. The emphasis in the earlier discussions on human-wildlife interactions were chiefly on the wildlife conservation and conflicts within forests.

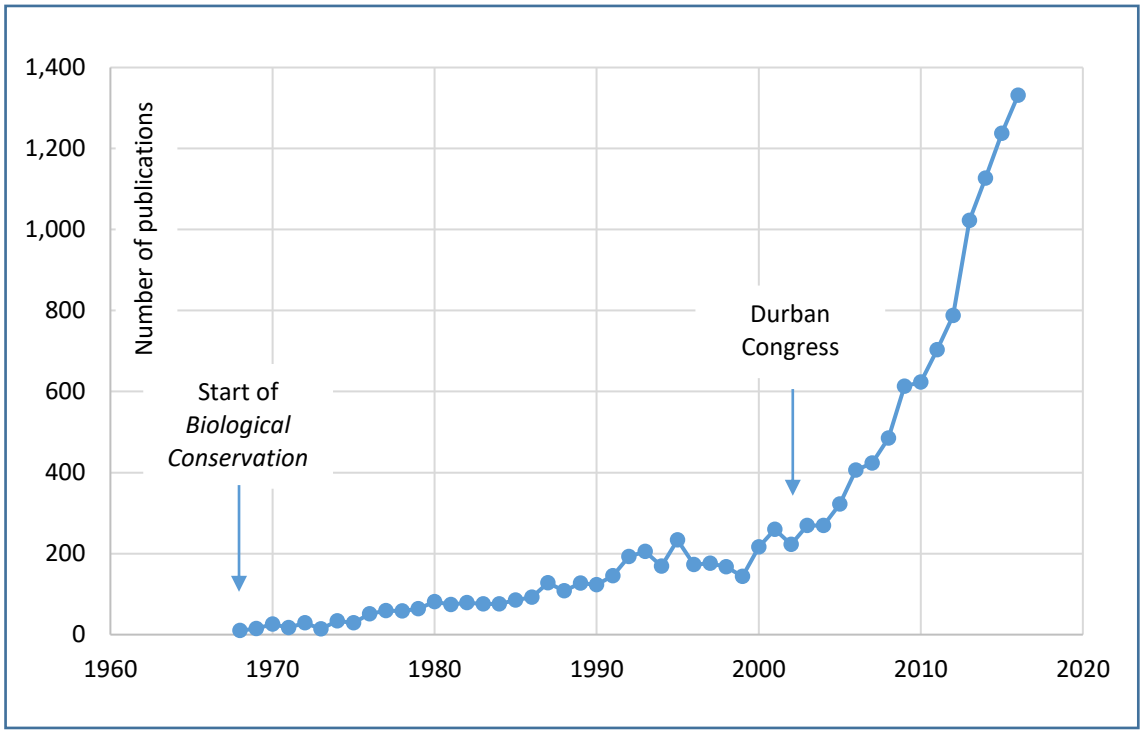

Figure 1.2 The number of publications that use as the keywords 'human-wildlife conflict'
Source and method: Scientific publications were retrieved from the *ScienceDirect* database. For search 'human-wildlife conflict' keyword was applied

Since 2000 the number of articles has constantly grown and many emphasise local people's perceptions of wildlife species, hidden dimensions of human-wildlife conflict, economic value of species management, compensation, tolerance or mainstreaming of coexistence with wildlife and other interrelated issues. This has probably come about because of the global recognition of the human-wildlife conflict, particularly following the Durban congress, where it was globally recognised as an important challenge in wildlife conservation. This event contributed not only to a change in approach to deal with conflicts but was also a platform where the global consultation on human-wildlife conflict took place. This assumption confirms Dickman (2010:458) as well, where it is argued that human-wildlife conflict is one of the most critical threats facing many wildlife species today, and the topic is now receiving increasing attention from conservation biologists.

In general, the term of Human-Wildlife Conflict refers to the interaction between wild animals and people about security, resources, wellbeing or their habitat. According to the Durban WPC Recommendation, the human-wildlife conflict is perceived as 'when the needs and behaviour of wildlife impact negatively on the goals of humans or when the goals of humans negatively impact the needs of wildlife. These conflicts may result when wildlife damage crops, injures or kills domestic animals, threaten or kill people' (Madden, 2004:248). A shorter meaning formulated by

Conover (2002:8), says that 'human-wildlife conflict occurs whenever an action by humans or wildlife has an adverse impact upon the other'.

Moreover, several definitions have been adopted. For example, the IUCN Species Survival Commission Human-Wildlife Conflict Task Force has defined the HWC as 'when animals pose a direct and recurring threat to the livelihood or safety of people, leading to the persecution of that species'[9]. Further, the Food and Agriculture Organisation of the United Nations (FAO) defines HWC as 'any human and wildlife interaction which results in negative effects on human social, economic, or cultural life, on wildlife conservation, or on the environment'[10].

From a biological point of view HWC, occurs when there is an overlap of human and wildlife habitat (Izumiyama et al. 2009). The problem becomes more sensitive when people feel that the values of wildlife, or their needs, are given priority over the needs of local people. Thereby the conflict between humans and wildlife turns to the conflict between humans about wildlife (Madden, 2004:249). Therefore, in the sense of a better understanding of the HWC, the Durban Congress was a starting point for further discussions of the common misconceptions of the conflict. This is because human-wildlife conflict often involves human-human conflict, which '[…] frequently involves an equally important conflict between people [actors] who have different goals, attitudes, values, feelings, levels of empowerment, and wealth' (Madden, 2004:250). Another, shorter description given by Peterson et al. (2010:78) specifies that 'human-wildlife conflict referred to human disagreements over wildlife management decisions'. As far as conflict with wildlife is concerned, this can be caused in struggles among people over management rights and use of resources or needs for their livelihood.

For the Sydney World Parks Congress of 2014 the theme of "Parks, People Planet: Inspiring Solutions" was selected and widely discussed the concept of "People Our Problem, People Our Solution". Following the Congress, the international journal Human Dimensions of Wildlife fully devoted Volume 20, 2015 (Issue 4) to the theme of "Perspectives of Human-Wildlife Conflict after ten years on". In this volume, a number of authors present the argument that the nature of the human-wildlife conflict is about conflict between different human actors in regard to 'how wildlife should be managed' (Hill, 2015:297).

At the end of the eighteenth century, natural scientists and philosophers contributed to the trend of studying the Alps and made mountains a central theme concerning nature conservation (Mathieu, 2011:121). In particular, nature conservation in mountain regions became the focus of

[9] See http://www.hwctf.org/about

[10] See http://www.fao.org/forestry/wildlife/67288/en

high mountain research. In the first issue of the Journal *Mountain Research and Development* (MRD) in 1981, the authors Hurni and Messerli (1981:50) in the article "Mountain research for conservation and development in Simen, Ethiopia", emphasise the conflicting interests between the preservation of a natural system and the need to extend agriculture. Moreover, the attention on human-wildlife conflicts were taken up by scholars and problematised much later.

By the beginning of the 1980s, there was a number of small chronicles about the ibex conservation project in European Alps and a symposium on ungulates (Wiersema, 1983:303). Later, Fox (1987:88) gives early communications on the study of Snow Leopard ecology and conservation in the Himalayan region. Hatley and Thompson (1985:365) discuss the topic "Rare animals, poor people, and big agencies: a perspective on Biological Conservation and Rural development in the Himalaya". From 1994, up to this point, predominantly the Himalayan region has been at the centre of attention by scholars (Fig. 1.3) and there is a prevalence of papers dealing with Asia.

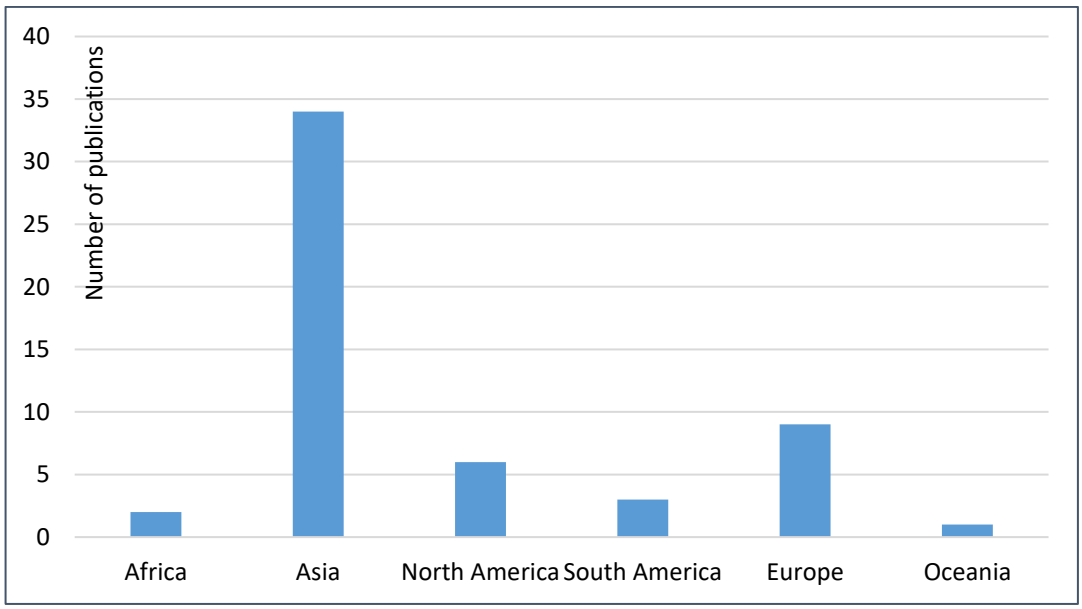

Figure 1.3 Regional focus based of publications on 'human-wildlife conflict' within MRD
Source and method: Periodical publications of *Mountain Research and Development* (MRD) were retrieved from the *JSTOR* database. For search 'human-wildlife conflict', keyword was applied, among total *n=668* results, selected only *n=55* relevant papers. Division of geographic regions based on United Nations country grouping

The first paper in Mountain Research and Development on conflict between pastoralists and wildlife conservation was published in 1994. The group of authors led by Joseph L. Fox problematised the challenges faced for large predator conservation such as snow leopard in the Indian Trans Himalayan region of Ladakh (Fox et al. 1994:39).

Primarily, articles covered Asian and European mountain regions including recreation-tourism, forests, land use, interrelation of national parks and indigenous people. Regarding the mountain

regions of the Soviet Union, they appear only in 1990 with the paper published by Badenkov (1990:129) on "Sustainable development of the mountain regions of the Soviet Union. The realities, the role of science, and research orientations" might be referred as the first paper covering the territory of the former Soviet Union within the scope of high mountain research. However, there is no information on human-wildlife interaction. This might be explained by limited access for foreign researchers due to the Cold War (1947-1991).

As Kyrgyzstan has been under Soviet jurisdiction during this time, where pastoralism played main role and nature protection was limited in certain areas, it would be obvious that the expansion of Protected Areas would create conflicts with economic entrepreneurships and agricultural practices including mobile pastoralism. Steppe and mountain regions became an arena of conflicts.

1.3 People and wildlife issues in Kyrgyzstan: pastoralists and predators

Natural resources play an important role in the economy of Kyrgyzstan, and in particular the mountain grasslands are a vital part of traditional pastoralism practices. Pastoralism is a main livelihood activity and income source for a dominant part of the rural mountain population of Kyrgyzstan. As a result, human-wildlife conflict is a major issue for sustainability of rural livelihoods and nature conservation. As there are people who undertake animal husbandry by using natural resources, as conservation efforts restore wildlife and protect their habitats, the confrontation and contact between human and wild animals is growing. Even charismatic[11] and endangered wild species may have serious impacts on rural livelihoods and human lives (Dickman, 2010:458; Leader-Williams and Hutton, 2005:142; Rosen et al. 2012).

Most of the territory of Kyrgyzstan is part of the Tien-Shan[12] and Pamir-Alai Mountains and characterised by a high level of species-richness, rarity of habitats and endemism (Ministry of Environmental Protection, 1998:25). This region is listed among "The Global 200" ecological priority regions of the Earth identified by WWF (Olson and Dinerstein, 2002).

Having the relationship of people and predators in mind it is important to analyse the various contributing factors. The vast environment of the Central Asian mountains was an area in which people ventured to exploit natural resources such as pastures, wildlife, minerals and fuels.

[11] The term charismatic species is used in conservation literature, definition of which refers to the flagship species that serve as symbols and stimulate conservation actions (Stork and Samways, 1995:491).

[12] Locally known as *Tengir-Too*, verbatim *Celestial Mountains* in Kyrgyz language, bearing the same meaning as Tian-Shan in Chinese. See also Schmidt, 2013:110.

With growing technological abilities and population, this relationship has developed into a conflict-prone one. One important field of conflict is the relationship between pastoralists and predators, between pasture use and the promotion of territories reserved for wildlife. In order to analyse this relationship, it is relevant to analyse the impact of the traditional belief system, conflict mitigation mechanisms and strategies of survival in shaping this relationship.

In High Asia, the mountains traditionally had a religious meaning and an importance in pilgrimage (Mathieu, 2011:123). For instance, in Kyrgyzstan's traditional pre-Islamic belief systems, mainly associated with *Tengirism*, *Animism* and *Shamanism* have contributed to nature protection and convinced people to respect their environment. There are a number of mountains or mountainous places named as sacred or after saints (Kyr. *Oluya-ata*) such as the Toskol-Ata, Padysha-Ata, Yssyk-Ata, Kochkor-Ata, Kölpön-Ata, and there are many other places where rituals or elements of worship remain. There is a patron saint, or supporter, (Kyr. *Koldoochu*) for each type of domesticated animal. The Kambar-Ata known as a patron saint of horses, Cholpon-Ata of sheep, Chychang-Ata of goats, Zengi-Ata of cows and Oisul-Ata of camels. The Kaiberen is known as the protector of all wild ungulates. Moreover, the names of five months of the year are taken from and associated with the wild animals. The months of March and April in Kyrgyz language are *Zhalgan Kuran* (false roe deer) and *Chyn Kuran* (true roe deer) accordingly. In March the male roe deer loses its horns and from a distance it is difficult to distinguish between the male and female roe deer. By April the male has already grown solid horns and is referred to as a true male roe deer. The months of May, June and July are called *Bugu* (male red deer), *Teke* (male ibex) and *Kulzha* (male argali) respectively and are explained with their behaviour in nature in a given time. Therefore, the wildlife of the mountains plays an important role in local culture (Ndam et al. 2000:46) and accordingly those cultural and spiritual values can benefit biodiversity conservation in general.

Despite stressing human wellbeing and wildlife conservation, not all species is tolerated by humans. In fact, due to the competition for space or resources many species come into conflict with human interests, because plants, grasslands and other resources of the mountains are also very important to the human livelihoods and resource utilisation. Conflict takes place in various contexts and forms, more often when species are damaging agricultural crops or linked with livestock losses. Consequently, nowadays human-wildlife conflicts are recognised among the main obstacles towards conservation and establishment of protected areas in developing countries (Thomassen et al. 2011:15).

Conflict mitigation measures are included in many wildlife conservation action plans over the world, especially when endangered or protected species are present. Human-wildlife conflict has existed for as long as humans and wild animals have shared the same landscapes and resources. In mountain territories, the conflict is dominantly associated with large mammals, specifically wild predators.

According to FAO, pastoralists in developing countries are economically more vulnerable than the people of developed countries. The FAO together with other partners has produced a 'Human-Wildlife Conflict Toolkit' which is currently being tested in Southern Africa (Le Bel et al. 2010:12). Specifically, the toolkit provides effective measures to help resolve, prevent and mitigate the growing problem of conflict between humans and wild animals. It is designed not only to help protect people, their livestock and crops from animals but, just as important, to safeguard animals from people.

Pastoralism has a long history in Central Asia where local people have practiced it for thousands of years and believed that it had relatively little negative impact on the environment (Browman, 1983:241). However, with the agrarian and development reforms in the socialist period the situation has changed in the region. The geographical landscape and vast highland pastures of Kyrgyzstan made possible the development of animal husbandry and the country became an important wool and meat provider within the economy of the Soviet Union. The establishment of collective farms, permanent settlements in former summer pastures, mechanisation of animal husbandry, improvement of social services and infrastructure for pastoralists, introduction of new breeds and other means of modernisation concepts has led to an increase in the number of livestock. State support of animal husbandry resulted in rapid growth of livestock numbers, which reached 3.8 million by 1931 (Dzhunushaliev, 2003:163) and then 11 million head of sheep by the 1980s (Wilson, 1997:61). The livestock grazed in natural mountain pastures and consequently had an impact on wildlife such as competition for pastures in a way of dietary and spatial overlap, habitat displacement (Butt and Turner, 2012; Mishra et al. 2004) or being an additional prey.

Agriculture plays a crucial economic role for two thirds of the current rural population of Kyrgyzstan. Animal husbandry, crop production, forestry, hunting and fishery together account for almost 14% of GDP of the country and about 30% of employment (NatStatCom, 2019:192).

After the dissolution of the Soviet Union in 1991 and privatisation of all livestock assets during 1991-1998, pastoralism became even more important for rural areas by becoming the single

source of income for local livelihoods. Therefore, human-wildlife interrelation in rural mountain areas is an important an often complex issue to understand.

Conflict with pastoralists due to livestock predation by large carnivores has risen sharply in recent years. Among other wild carnivores such as brown bear, snow leopard, red fox (*Vulpes vulpes*) and jackal (*Canis aureus*), the wolf is perhaps the most frequently blamed animal for depredation on livestock in Kyrgyzstan. Jackson et al. (1996:241) argue that the increase of attacks by predators are attributed to a number of factors, such as application of wildlife protection regulations, and the establishment of protected areas, "which serve as refuges from which predators can populate the surrounding area, the depletion of natural prey due to poaching and loss of habitat, and lax livestock herding practices".

Human-wildlife interaction is important and changes in biodiversity have impacted on the livelihood and welfare of people. Livestock predation by wild predators is almost inevitable in areas of overlap in human-wildlife habitat. This leads to a significant conflict between conservation goals and the livelihood needs of pastoralists (Oli et al. 1994; Takahata et al. 2014). In particular, the 'wolf issue', dominantly expressed as livestock depredation, has increased in recent decades in Kyrgyzstan. This concern has made itself felt in different ways through the complaints of pastoralists to state and municipal administration, as well as given wide attention by the local media. For example, popular news agency AKIpress introduced a special news block called 'The Wolf Season' (Kyr. *Karyshkyr sezonu* and Rus. *Volchiy sezon*), where news about livestock predation cases and hunting of wolves generates public discussions as well as in social network. Despite much debate about the human-wildlife conflicts, in Kyrgyzstan the issue of livestock depredation by wild predators remain poorly understood.

Local government representatives and related state agencies are regularly reporting on livestock losses from wolves, with associated statements about their uncontrolled population growth. Precise statistics on economic losses are hard to come by, due to the irregularity of data collection and usually only in 'hot seasons' when the issue arises.

Wolves prey on all kind of domestic animals and valued game species such as argali, ibex, roe deer and compete with other endangered species such snow leopard for food and in some cases fatally injure humans (Sillero-Zubiri and Switzer, 2004). Persecution of predators and their relationship with pastoralists has a long history and tradition and the public perception of wolves has been changing over time. It is pertinent to ask what the factors are behind the pastoralist - predator conflict. What kind of debates are going on around this issue? As this issue is multi-

faceted and has many aspects, such as human population growth, shrinking of pastoral spaces, mining activities, wildlife habitat fragmentation, and the expansion of infrastructure and development projects. Probably one of the most discussed questions is the overall conflict between 'people and parks' or between interests of human and conservation of the natural environment in general. Historically, even in different settings of the socio-economic environment, wildlife coexisted to a certain level with local communities. Today, alongside with integration to the global environmental agenda, accompanied with influences and value systems, the attitude towards wildlife and acceptance of nature is changing. Human-wildlife conflicts are accepted differently by different parts of society, particularly between urban and rural communities, and the 'traditional' and 'modern' views of wildlife (Thomassen, 2011:17).

The problem is acute almost across the entire mountain regions of Kyrgyzstan. Despite arguments by conservationists that the wolf's natural predation of wild ungulates such as argali and ibex is dwarfed compared to intensive poaching, wolves are considered by hunters as a competitor for valued game species. Despite frequent conflicts between wolves and humans, there are few up to date studies available in Kyrgyzstan on these issues (Izumiyama et al. 2009).

Established in 1964, the IUCN Red List of Threatened Species has evolved to become the world's most comprehensive information source and globally recognised as guideline tool. Therefore species classification (Box 1.3) remain important for national conservation policy development and wildlife management (Vandergeest and Peluso, 2015:165).

Box 1.3 Wildlife classification

The IUCN Red List of Threatened Species defines nine classifications. There are Not Evaluated (NE), Data Deficient (DD), Least Concern (LC), Near Threatened (NT), Vulnerable (VU), Endangered (EN), Critically Endangered (CR), Extinct in the World (EW) and Extinct (EX). Moreover, conservation organisations offer another concept of classification of wildlife, such as flagship, umbrella, keystone, priority and indicator species (Ducarme et al. 2013). In accordance with this approach grey wolf is defined as a keystone species, which is a species that has a large impact on its habitat ecosystem and plays a critical role in maintaining the structure of the ecological community, thereby affecting many other species (Simberloff, 1998:255). However, in the situation of Kyrgyzstan, the wolf is defined as a pest and classified as 'least concern' (LC) in the frame of IUCN Red List of Threatened Species (Boitani et al. 2018). For instance, the European Environment Agency in the publication series "10 messages for 2010", focusing on specific

mountain ecosystems, refers to the distribution of wolf and brown bear as 'wilderness quality index' within Natura 2000[13] sites (Zisenis et al. 2010).

Generally, an endangered status strongly helps to raise funds for conservation and research programs. It helps the donor organisations to prioritise their conservation targets and decide the allocation of funding. For instance, until 2017, the snow leopard was defined as globally 'Endangered' (EN) and used for promotion of conservation action plans (McCarthy et al. 2017). Moreover, species classification remains important for wildlife management (Box 1.4) as well.

While some wild species are endangered and declining globally due to anthropogenic pressures, others have succeeded in surviving (Sillero-Zubiri and Switzer, 2004) resulting in conflicts with people. Wild predators are valued as a symbol and beautiful creatures of nature, but also negatively affect the livelihoods of mountain communities. Typically, wild carnivores attack livestock during grazing in high mountain pastures or venture into cattle-corrals, and that pushes pastoralists to change their attitude toward wildlife conservation. The conflict becomes serious when endangered species are involved and rural livelihoods are at risk (Mishra, 1997; Mishra et al. 2003; Nyhus, 2016).

Box 1.4 Definition of wildlife management

Historically, wildlife management dealt with increasing game populations for hunters by protecting the animals from overharvesting and by protecting and managing wildlife habitats (Conover, 2002:8). In 1933, Aldo Leopold published the book 'Game management' which is considered as the commencement of the discipline of wildlife management. The term wildlife management was referred to as game management and had a general aim to increase the number of hunting species through control of hunting and limiting the kill (Leopold, 1986:16). Since then the situation has changed and many wild predators have become protected under national threatened species legislation in many countries. In this regard, the term wildlife management began to cover wildlife conservation as well. Some other scholars (Sinclair et al. 2006; Krausman and Cain, 2013) put conservation separate, naming this field as wildlife management and conservation. However within the thesis the commonly accepted definition is applied and defines wildlife management as a general term for the administration of wildlife

[13] Natura 2000 is a network of core breeding and resting sites for rare and threatened species, and some rare natural habitat types which are protected in their own right. It stretches across all 28 EU countries, both on land and at sea. The aim of the network is to ensure the long-term survival of most valuable and threatened species and habitats of Europe, listed under both the Birds Directive and the Habitats Directive of the European Commission. See http://ec.europa.eu/environment/nature/natura2000/index_en.htm

resources by humans at desirable levels and covers the control of taking by hunting, wildlife conservation and predator control measures.

Study of the wolf population demography is difficult, requiring long-term and expensive projects. Nevertheless, available data through the State Agency on Environmental Protection and Forestry (2020) indicate that the population of wolves in Kyrgyzstan is about 4,500 at this time.

Madden (2004:248) notes that the conflict intensifies "… when local people feel that the needs or values of wildlife are given priority over their own needs, or when local institutions and people are inadequately empowered to deal with the conflict".

The most widely accepted perception among pastoralists is that during the socialist era, the issue of predators was under control by government and every shepherd of collective and state farms was provided with a rifle. After independence, pastoralists no longer have such support of the state, and the new hunting regulation and license procedures are not clear to most of them yet. The conservationist community argues that this phenomenon is linked directly with the utilisation of other wildlife resources, particularly the high level of poaching of wild ungulates, which is the wolves' natural prey. At the same time, representatives of the Kyrgyz Association of Hunters and Fishermen claim that the bounty system for culling of wolves and jackals is not effective and allocated funds are usually not sufficient or simply do not reach them. To many, the wolf represents the true spirit of the wild – elusive, beautiful, intelligent, a charismatic and social beast. Yet to others, the wolf is a pest animal, a creature to be feared and hunted down.

Wolves were eradicated from the wild nature in many countries. And nowadays, many countries spend significant funds to restore or reintroduce them in their previous habitats. Many studies argue that wolves within their biological role are a keystone species and critical to the maintenance of a balanced and healthy ecosystem (Bibikov, 1985; Carbyn et al. 1995; Chapron et al. 2014; Mech and Boitani 2003; Woodroffe et al. 2005). There are initiatives from civil society of Kyrgyzstan advocating groups who produce special documentaries about nature protection where the wolf is portrayed as the key and 'useful' species. Most of them were primarily inspired by the novel, "The Scaffold" (Kyr. *Kyamat*, 1986), by the famous writer Chyngyz Aitmatov. In his novel, the relationship between a pair of wolves and some shepherds, present a philosophy on a human-nature interrelationship. Later based on this story the famous movie of producer Dooronbek Sadyrbaev "The Tears of Akbara-Wolf" (1989) (Kyr. *Akbaranyn köz zhashy*), which was widely broadcasted in Kyrgyzstan, benefited the cause of national conservationists. Most recently the documentary film "Kök-Börü" (The Grey Wolf) (2012) of Kyrgyztelefilm, produced by

Erkin Sheishenaliev and broadcast on the national television channel, provides another perspective and thoughts on the issue. The combined effect of these views was to establish a lobby group among lawmakers in the Kyrgyz Parliament which has on several occasions initiated a law on moratorium to hunting in the republic. This has resulted in even wider discussions in society. One part of society considers hunting as a main threat to wildlife, whereas another sector strongly believes that only hunting can guarantee sustainable use of resources as hunting is widely accepted as a contributor for nature conservation. Although the general society is no longer keen to see wolves killed, even they come into conflict with farmers. This perception is not necessarily supported among people who in reality share landscapes with wild carnivores (Sillero-Zubiri and Switzer, 2004).

As Madden emphasises (2004:249) that when "…authorities fail to address the needs of the local people or to work with them to address such conflict adequately, the conflict intensifies, becoming not only conflict between humans and wildlife, but also *between* humans *about* wildlife". All these struggles generate actors involved in the conflict. These interests, influences and powers between actors about wildlife shape the politics and mechanisms of resource utilisation.

In addition, Hill (2015:297) argues that conservation practitioners are designing their works on reducing economic losses of farmers due to wildlife, for instance preventive measures to protect livestock from wild predators would likely reduce conflicts. Moreover, it is presupposed that human-wildlife conflicts are about 'cost of co-existence'. Therefore, to establish a broader understanding of human-wildlife interactions Peterson et al. (2010:78) argue that the conflict should be considered within the sphere of a 'human-human conflict'. This is because tensions and conflict of interest between different actors or stakeholder groups is actually a central issue (Schmidt, 2008). For instance, since independence the area of protected areas in Kyrgyzstan has increased almost six times and constitutes about seven percent of the country's territory (State Agency on Environmental Protection and Forestry, 2017). In accordance with the National Strategy for Sustainable Development for 2013-2017, the government's agenda was to increase this number by attracting 'Green Investments' (National Council for Sustainable Development of the Kyrgyz Republic, 2013:46) and in 2016 there were established two new State Nature Parks. Recently adopted in 2018, the National Development Strategy of the Kyrgyz Republic for 2018-2040, declared to increase the area of Protected Areas by up to ten percent (National Council for Sustainable Development of the Kyrgyz Republic, 2018:49). The current national environmental policy is linked to the obligations within the Aichi targets of the Convention on Biological Diversity

to which Kyrgyzstan became a Party in 1996. The Aichi targets declare *"To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity"* by 2020 and where at least 17% of terrestrial and inland water is conserved (Convention on Biological Diversity, 2011). The environmental agenda of the Kyrgyz Government included the establishment of new protected areas, including the Alai National Park (around 370 thousand hectares) with the aim to reach ten percent of the country as protected by 2020 (State Agency on Environmental Protection and Forestry, 2016). However, there are some challenges on the way to reach this goal, such as conflicts between Protected Areas management and pastoralists over access to pastures.

Taking into account that the human-wildlife conflict is complex, there are many other aspects to consider, particularly within a historical context, especially since Kyrgyzstan has experienced two different socio-economic settings and political regimes. Therefore, to better understand the human-wildlife conflicts, particularly between pastoralists and predators the application of political ecology could be a useful approach. Given the complexity of the issue and the need to cover broad aspects of it, the research focused on a case study in the Alai region.

The growing pressure on available ecological resources has increased over time. The relationship between environment and society, between pastoralists and predators, between economics and nature protection has come under increasing strength of conflicts.

The above-mentioned aspects reveal that a complex relationship has emerged that includes more challenging that appears by looking only on the binary relationships. In order to gain more insight into the various and complex relationships it seemed advisable to apply a Political Ecology approach. It allows to give a space to various aspects and to analyse existing interlinkages. By applying a Political Ecology lens the justification should be given to actors and the effect of their practices, to salient interests by conflicting stakeholders, to individuals and communities, to external and internal interests, to powerful institutions and the implementation of programmes and action plans.

However, before the concept is introduced, a second limitation needs to be highlighted. Regional differences are important is assessing the mentioned relationships and interlinkages. At the same time, it is understood that a case study approach provides the necessary depth based on changeable empirical evidence. For this purpose, the Alai Valley in Southern Kyrgyzstan was selected as a region in which ongoing processes could be observed and the spectrum of conflicts prevail.

1.4 Environmental setting, ecological and economical potential of the research area – Alai Valley

> Too many things of Kyrgyz history are connected with this land. This is the Queen of Alai, Alai bazar in Tashkent, Alai breed of sheep, through this valley will pass main transport corridor through Erkechtam to China, roads to Zhergetal and Badakhshan of Tajikistan, and more…
> (Mambetov, 2006, own translation)

Administratively the Alai Valley[14] was organised as the Alai-Gulchinsky rayon in 1928. Later in 1936, it was divided into Alai and Chong-Alai rayons and in 1959 these two administrative territories were merged into the one Alai rayon. After independence of Kyrgyzstan in 1992, the eastern part of the valley was separated again as the Chong-Alai and the western part went under the administration of Alai rayon with its center in Gülchö (NatStatCom, 2010:238). Within the Alai Valley there are five key settlements including Daroot-Korgon as the administrative center, Karamyk and Kashka-Suu of Chong-Alai rayon, Sary-Tash – on the crossroads, and Erkechtam as the trading gate for goods coming from China (Fig. 1.4). During the prosperous Great Silk Road era, caravan routes passed through the Alai Valley from Kashgar (Shahrani, 2002:23) to other cities of the Fergana valley and to further main trading cities.

The geographic location of the Pamir-Alai region in Central Asia established it as the meeting point of interests and influences of various powers over a long period of history (Kreutzmann, 2016b). Moreover, in recent decades, the natural landscape of the region came under the increasing international attention with regard to nature conservation, sustainable land management (Watanabe, 2016:268) and mining (Doolot and Heathershaw, 2015).

The ecological features, such as a high rate of endemism, and rare flora and fauna, place this mountainous territory among priority regions in global biodiversity conservation (Shukurov, 2016:36). Alongside with charismatic large mammals such as snow leopard, brown bear, lynx, wolf, argali and ibex, the Alai Mountains are an important stronghold for iconic birds of prey as well. The area is crucial for breeding populations of many nationally and globally endangered birds, including the lammergeyer (*Gypaetus barbatus*), black vulture *(Aegypius monachus),* Eurasian griffon *(Gyps fulvus)*, Himalayan griffon *(Gypaetus himalayensis)*, saker falcon *(Falco cherrug)*, Egyptian vulture (*Neophron percnopterus*), golden eagle *(Aquila chrysaetos)* and many others (UNEP-GEF, 2009:11).

[14] Within the research area, the Alai Valley is defined by the administrative borders of Chong-Alai rayon, and the southern part of Alai rayon of Osh oblast. However, there is also another approach that defines the valley within the watershed of the Kyzyl-Suu River (see Parmanasov, 1979:11; Shirasaka et al. 2016:129).

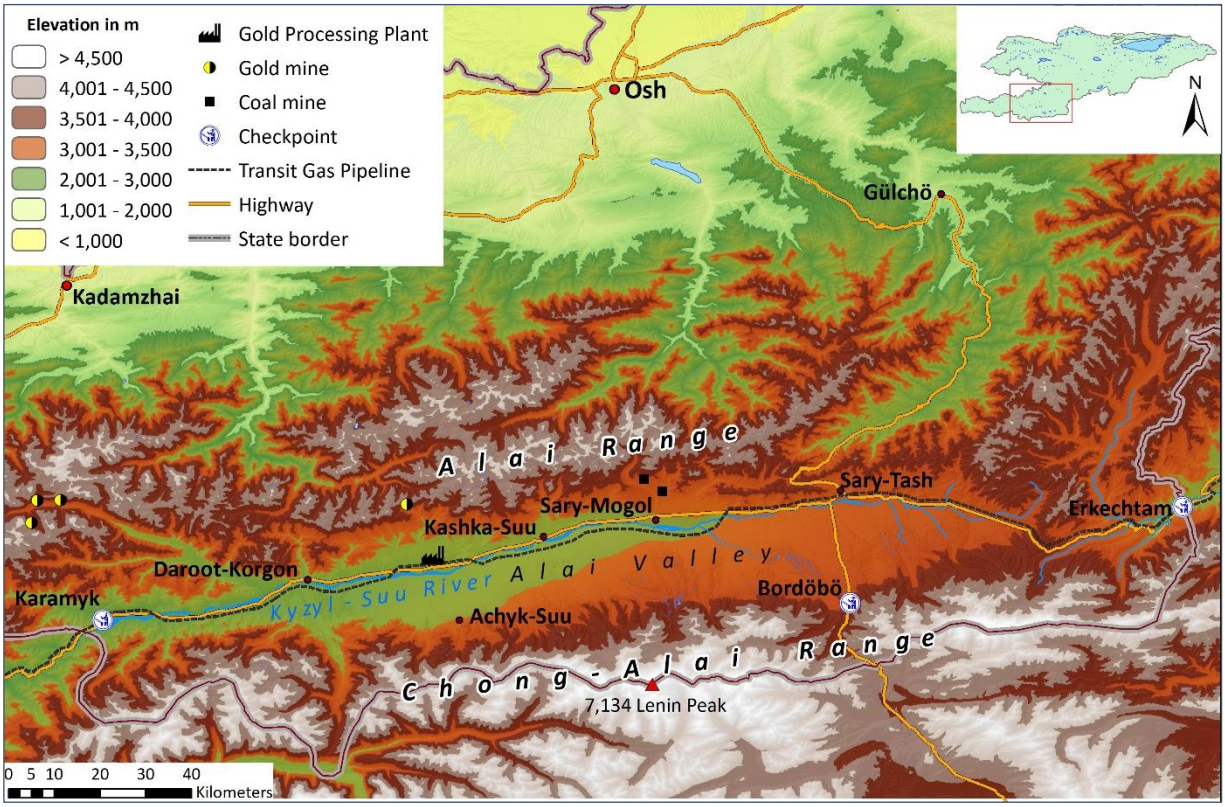

Figure 1.4 Location of study area – the Alai Valley
Source: Based on topographic map of Kyrgyzstan (2006), own field survey (2015 and 2018) and Shuttle Radar Topography Mission (SRTM) elevation data
Cartography: M. Anarbaev

The hotspot also holds a variety of wild ungulates, such as roe deer, argali and ibex. Among them, the ibex is the most widespread species, occurring in many parts of the region. The argali, known also as the Marco Polo sheep, is famous for its magnificent curling horns and is highly valued as a trophy species. This migratory species was assessed as Near Threatened (NT) by IUCN in 2008. Despite that fact, that all three subspecies of argali are listed in the National Red Book of Kyrgyzstan, hunting is open for international trophy hunters. Since 2014 the Convention on the Conservation of Migratory Species of Wild Animals (CMS), also known as the Bonn Convention, have placed the argali within the scope of interest of the Central Asian Mammals Initiative (CAMI) to conserve migratory mammals and their habitat in the region (CMS, 2014:1).

The predominant vegetation in the Alai Mountain Range is alpine steppe (Arase et al. 2013:62), high mountain meadow steppe and mountain forest meadows (Jansky and Pachova 2006). Despite the lack of a full inventory of the area's invertebrates, the grasslands are rich in insect diversity. For instance, from the twenty-six known beautiful Apollo butterflies, eleven species are endemic to Alai (GEF-UNEP, 2009:11).

The Alai Valley is home for endemic plants as well, for instance Iskandera Alaiskaya *(Iskandera alaica*) is found only within the Alai Valley. Wild onion *(Allium alaicum),* flowering plants

(Asphodelaceae Eremurus alaicus, Physochlaina alaica, Cnidiocarpa alaica, Centaurea alaica, Cousinia alaica), all bear the name of the valley in their scientific name and are nationally defined as Vulnarable (VU) plants (Ionov and Laskov, 2006:49-50).

The lesser-known Alai mole vole (*Ellobius alaicus*) is recorded only in the Alai Mountains. Very limited data is available about this species' distribution, population size and other features. Since 1996, the experts from IUCN Red List gave it the category of an Endangered (EN) species and since 2008 it has been listed as Data Deficient (DD) (Tsytsulina, 2008).

In accordance with the Red Book of Kyrgyzstan the Eurasian otter (*Lutra lutra*) is probably remaining only in the Kyzyl-Suu River[15] basin within the Alai Valley (Kumushaliev, 2006:505). Moreover, the Alai region became a priority area for science and conservation of mountain endemic amphibians and reptiles. For instance, in 2016, scientists recorded a new species as Alai pit viper (*Gloydius rickmersi*) which is named in honour of Willi Rickmer Rickmers[16], who was co-chair of the German-Soviet Alai-Pamir Expedition in 1928 to this area. The newly described species is found only in the Alai region (Wagner et al. 2016:4). All of these ecological features provide additional evidence for the importance of conservation, ecological potential and value of ecosystem services in the by Alai region.

1.4.1 Early exploration of the Alai Valley

> Alexei Pavlovich Fedchenko during his travel to the Alai noted that
> 'the surface of the Moon was better known than this land…'
>
> (Beletsky, 2013:10)

Scientific exploration of the Alai Valley commenced mainly during the Tsarist era. In 1871 Russian researcher-naturalist, Alexei Fedchenko, visited the region through the Tengizbai Pass and compiled his first geographic reports on the Alai Ranges. In that time the territory was under the authority of the Kokand Khanate and the commandant of the Daroot-Korgon Fortress[17] did not

[15] Means *Red River* and is derived from the reddish-brown turbidity.

[16] German explorer, son of a Hanseatic ship-owner family Willi Rickmer Rickmers (1973-1965) several times visited Western Turkestan, also known as Russian Turkestan. He contributed to scientific explorations of Pamir and Alai Mountains. In addition to glaciology and geology, he had an interest on traditional local objects of the region. For instance, he collected about 1,000 objects that include artefacts made by nomads as well as urban handicrafts and nowadays exposed in the Ethnological Museum of Berlin.

[17] Daroot-Korgon is a relatively small fortress made from clay wall. During the nineteenth century much of the territory of Kyrgyzstan came under the political sovereignty of the Kokand (Kyr. *Kokon*) Khanate until the Russian conquest of the region in 1876. The Kyrgyz however, enjoyed considerable political and military power during the reign of the Alymbek Datka, and later (1862-1878) under his wife, Kurmanzhan Datka, known as the Queen of Alai. In 1906, she was visited by Colonel Carl Gustaf Emil Mannerheim during his intelligence mission from Russian Turkestan to Peking. At that time Mannerheim was in the Russian army and later would become the sixth President of Finland (1944-1946). He took several photographs of her at age of 95 years.

allow him to penetrate southward. Nevertheless, he was able to map the Kyzyl-Suu River as one of the main upper streams of Amu-Darya River and estimate the elevation of the highest peak of the Chong-Alai Range. In that time the highest known point of Turkestan and named as Kaufmann Peak[18], was in honour of the General-Governor of Russian Turkestan (Beletsky, 2013:3; Leonov, 1972:60; Rickmer-Rickmers, 1930:151). Fedchenko also made a note about salt mining in the Altyn-Dara and the cultivation of small plots of alfa-alfa and spring wheat by Kyrgyz pastoralists in the western side of the Alai Valley without irrigation. The seeds they were bringing from the Karategin and mowing only two times, while in the Fergana Valley it is possible to mow four-five times in a season (Leonov, 1951:175).

Later in 1876, the Kokand Khanate was rapidly conquered by the Russian Empire after the execution of Pulat Khan[19] in Margelan city. This made it possible for further active investigation of previously unknown mountain regions. In 1876 and 1878, the zoologist and geographer Vasily Fedorovich Oshanin lead an expedition to the Karategin, Alai and Pamir. He described the huge glacier in the Pamir and named it the Fedchenko glacier (Mushketov, 1886:284-285).

Prior to the visit of Pyotr Petrovich Semyonov in 1856, the biodiversity of Tien-Shan Mountains was almost *terra incognita* 'white spot' for geographers, cartographers and naturalists. He compiled the first documented reports on the habitats of large mammals such as tigers, snow leopards and wild ungulates. For his geographic explorations, later, he was honoured to be named Semyonov-Tyanshansky.

Later within 1864-1868, the well-known explorer Nikolai Alekseevich Severtsov[20] worked on faunistic investigations. His work on the "Vertical and horizontal distribution of species of Turkestan" was published in 1873. Under the leadership of Severtsov, the Fergana-Pamir expedition took place in 1977 (Kuznetsov, 1948:6). As a rule, the survey involved geologists, zoologists, topographers and astrologists. Among them were many future famous researchers of Central Asia. The main task was to describe the region and map the available routes towards the Pamir, especially to access its inner parts.

According to Luknitsky (1955) the Alai means *paradise* where livestock can gain weight quickly, but also means *astonishment* (Leonov, 1951:177). The valley is surrounded by the Alai Range in the north and the Chong-Alai Range from the south (Kyr. *Chong* – big). It is also known as the

[18] In 1928 peak renamed to the Lenin Peak after the first leader of the Soviet Union Vladimir Lenin.

[19] Proclaimed Khan of Kokand Khanate in 1875, after the overthrow of Khudayar Khan. Real name is Iskhak Asan uulu. Belongs to Kyrgyz kinship group of Boston.

[20] The first journey he made in 1857 from Orenburg to Kyzyl-Kum and lowlands of Syr-Darya River. In 1858 while he was hunting, captured by Kokand officers and was one month in captivity. In 1864 he came back to Tien-Shan. There are many wild species named after his name.

Trans-Alai or Pamiro-Alai, as the range adjoins the Pamir Mountain (Watanabe et al. 2013:103; Dörre, 2016:101). In the Soviet literature, it is known as Zaalaisky[21], because Russian geographers came to the valley from the northern part, from Osh city through the Tengizbai Pass of the Alai Range. When A. Fedchenko was faced with another higher mountain, he named it Zaalaisky Range (Beletsky, 2013:9), which means "after or behind Alai" (*Za-Alai*) from Russian language.

Since that time, other researchers started to visit the region. The region attracted new interest for more detailed research in 1928. Together with colleagues from Germany and the Soviet Academy of Science, led by Nikolai Gorbunov and Willi Rickmer Rickmers, the Soviet-German Alai-Pamir Expedition was organised (Fig. 1.5). For the first time, three members of a German group, succeeded in the climbing of Peak Lenin (7,134 m). Until 1933, before discovering Peak Kommunizma[22] (7,495 m) it was referred to as the highest point of the Soviet Union.

Figure 1.5 The Daroot-Korgon Fortress in the Alai Valley in 1928
Lenin Peak is above the right tower
Photograph: Ludwig Nöth. *Source:* Borchers (1931:248a)

[21] Same approach is used for Zailisky range, Zaibaikalsky, Zakaspiisky, Zakavkazsky and etc.

[22] This peak was documented during the Tajik-Pamir Expedition in 1931-32 and named after Joseph Stalin. However, it was renamed to the Peak of Kommunizm in 1962 due to the deStalinisation campaign. Later independent Tajikistan changed the name to the Peak of Ismoil Somoni.

In 1933, the zoologist A. M. Andrushko was working on rodents in the Alai Valley and their impact on the pastures. Later in 1934 the state organisation *SOJUZPUSHNINA*[23] which was dealing with peltry had evaluated the available wildlife resources and potential in the harvesting of marmots (Kuznetsov, 1948:14) and for many years they were hunted for their pelts and fat.

The Alai Range is described as asymmetric. While the northern slopes cover wide territories, the southern part is short and connects with the Alai Valley. By 1935 the northern part of the Alai Range was comparatively well investigated, and because the first basic geological surveys took place there it is thus referred to as the cradle of geological surveys in Central Asia (Markovsky, 1935:313). Before the Soviet Union's systematic interests, the surveys had predominantly followed a militaristic purpose, because of the competition with Great Britain in the region for resources. Within the industrialisation program of the Soviets, detailed data on minerals, glaciers, and water resources to optimize irrigation potential for agriculture alongside of Amu-Darya basin, was essential.

1.4.2 Ecological characteristics of the Alai Valley

The Alai Valley is a mountain valley with a plateauing structure at an altitude of around 2,800 meters above sea level with a length of 185 km and a total area of 7,910 km^2 (Liu and Watanabe, 2016:115). The valley bottom is characterised as slightly north-west inclined steppe grassland with a combination of ancient moraines called by the locals as *Chukur*[24] (Borneman, 1935:330). The hummocky moraines are named and recognised as *Chukury* in the entire Pamir region as well as in the cartography (Watanabe et al. 2013:107).

The ecological setting of the Alai Valley is regarded as an arid mountainous continental climate with long and cold winters. The summer is dry and cool, with an annual precipitation of about 300-450 mm (State Agency on Environmental Protection and Forestry, 2016:27), accompanied by intense insolation, and fluctuations of seasonal and diurnal temperature (Wagner et al. 2016:3). The Alai Valley is referred to as the largest summer pasture of Kyrgyzstan. The precipitation mostly falls between early spring and summer. The cold season is long, up to seven months. An average snow depth in wintertime is 30-60 centimetres with an absolute minimum temperature of -40°C to -42°C (Umurzakov, 1982:95).

[23] Central organisation-monopolist of the Soviet Union in fur and peltry trading founded on 24 October 1931 with the headquarters in Leningrad (St. Petersburg).

[24] Chukur in Kyrgyz language means a hollow or a depression in the ground. In Russian, the term is given in the plural form as Chukury.

Within the Alai Valley, there are two working meteorological stations (MS). The MS Sary-Tash is among the older stations in the country and has been operating since 1933 at an alleviation of 3,155 m above sea level. The MS Daroot-Korgon was established in 1946 at 2,470 m in the western part of the valley. Climatic data from these meteorological stations is shown in the Table 1.2 below.

The western part of the valley is characterised by warmer air temperature at a comparatively lower altitude. This makes it possible to cultivate a variety of crops, while the eastern part of the valley is dominantly pastoralism with a limited range of crop production (Shirasaka et al. 2016:129). The area of cropland is small, being around one percent of the total area. Therefore, local people make a living from subsistence agriculture (Förster et al. 2011:306).

The glaciers and mountain rivers of Kyrgyzstan provide the source of water for agriculture for the Central Asia region. The first efforts of researchers within the expeditions of 1930s were oriented to investigate the hydro potential with the aim to optimize and increase agriculture in the lowland valleys. Later the results of the investigations were applied in the design of mountain water reservoirs to regulate river flow (Karaulov, 1935:269).

Table 1.2 Annual average temperatures within the Alai Valley

Meteo-Station	Month												Annual Average °C
	1	2	3	4	5	6	7	8	9	10	11	12	
Sary-Tash (3,155 m)	-17.1	-14.7	-9.5	-2.2	3.3	6.5	9.6	9.6	5.5	-1.1	-9.9	-14.3	-2.9
Daroot-Korgon (2,470 m)	-13.6	-11.0	-4.3	4.3	9.3	12.9	16.2	16.0	11.7	4.9	-8.9	-10.1	2.7

Source: Bazhanova, 2009:2, MS Daroot-Korgon (1946-2005) and MS Sary-Tash (1933-2005) of the KyrgyzHyrdoMet

Kyrgyzstan has over 3,500 rivers and is the only country in Central Asia whose water resources are fully formed within its own territory (State Agency on Environmental Protection and Forestry, 2016:47). Within the Alai Valley, flowing from East to West, the River Kyzyl-Suu contributes to the Amu-Darya River basin. The river has a light reddish colour because of the specific clay.

In the eastern part of the valley there are several rivers, including Kök-Suu (Blue river), which are the headwaters of the Kyzyl-Suu (Eastern) being the part of the Tarim basin that occurs within the Xinjiang Autonomous Region of the People' Republic of China. Most of the rivers are fed from glacier-snow but some originate from ground water (Markovsky, 1935:314).

In a hydrological context, only the western Kyzyl-Suu River was under regular investigation because of its importance for irrigation and energy supply of lowland areas in the Fergana Valley.

The river is 194 km in length, with a catchment area of 7,774 km^2 and a 9-11% gradient. The operation of a permanent hydro post was launched in 1955 which is 2 km lower from the settlement of Daroot-Korgon. The observations indicate an increase of air temperature and water flow, particularly since 1972 where the average annual volume of water flow increased from 10 m^3/sec to the present average annual flow of 61.3 m^3/sec at the border with Tajikistan (Bazhanova, 2009:12).

In the mountain areas, due to harsh environmental conditions, issues related to energy resources and its provision were dictated by priority tasks. Within the Tajik-Pamir Expedition in 1934, (Rus. *Tadzhiksko-Pamirskaya Expeditsia*) priority was given to fossil fuel investigations. Nevertheless, coal was not found in the Pamirs of Gorno-Badakhshan Autonomous Oblast (GBAO) of Tajikistan, except peat deposits in Central and Eastern Pamir (Markovsky, 1935:308). By comparison, in the Alai Valley, coal, limestone, and small-scale gold deposits were discovered (ibid:319). Moreover, based on information from the Kyrgyz State Agency on Mineral Resources, in the 1980s several geological and geophysical works were carried out. Licensed surveys near to Achyk-Tash village confirmed the availability of oil and gas deposits in the Alai, which increased the external interests in the region. Despite those comparatively few geological investigations, the Alai Range is considered as a rich source of brown coal deposits.

To meet the overall energy demand for fuel, locals use coal, and electricity from the central grid, as well as traditional biomass dung (Kyr. *tezek*) from the livestock. Firewood resources are limited and located dominantly in the western part of the valley, within the border of local forestry (Rus. *leskhoz,* Kyr. *tokoi charba*). Coal is locally available to the entire region from an open cut coalmine operating near to Sary-Mogol village. Nevertheless, a vital source of livelihoods in the Alai Valley remains pastoralism.

1.4.3 Mining and investment projects and economic transfer

> For it was no secret that in Central Asia lay some of the last great prizes of the twentieth century. These included fabulous oil and gas reserves, together with rich hoards of gold, silver, copper, zinc, lead and iron ore, not to mention crucial oil-pipeline routes
> (Hopkirk, 2006:ii)

The Alai region was among key areas, as Russian literature refers to as *forpost*[25] zones, during the "Great Game"[26], when Russian and British Empires faced each other for geopolitical

[25] Military term originates from German word *vorpost* which means advanced outpost.

[26] The term refers to the struggle between the British Empire and the Russian Empire for the supremacy over Central Asia in the nineteenth century. In Russian language literature is known as *Bolshaya igra.*

dominance in Central Asia (Kreutzmann, 2017:5). Since then many parameters, the number of actors, their interests, the influx of funds and the scale of events, has changed. Now this region has again become a part of the Modern Great Game for external political primacy and geo-economic interests, and influence, particularly for markets and access to the natural resources of Central Asia. For instance, neighbouring China has enormous interests ranging from security to trading and to ensure the economic prosperity of Xinjiang Province. The region is also considered as an important source of fuel for the 'energy-hungry Chinese economy' (Hu, 2005:130). After the dissolution of the Soviet Union, the region has long been the subject of research in leading centers and many scholars have referred to the 'New Great Game' (Cooley, 2012; Hopkirk, 2006:8; Laruelle et al. 2010; Rashid, 2000). Officially, Beijing implements an active, but balanced policy in the region. They also consider other powerful geopolitical players such as Russia and the USA. For this purpose, China uses the Shanghai Cooperation Organisation (SCO)[27] as a platform not only for regional security issues, but also for bilateral economic relations (Hu, 2005:135). Socio-political and economical ties between Russia and Kyrgyzstan are significant and involves all spheres. As a strategic partner, Russia provides regular support and has written-off 703.2 million USD of Kyrgyzstan debt since 2006. However, by 2016 China has already passed Russia as the main trading partner of the country[28].

Besides, China has steadily provided loans for several national projects and has become a major creditor in Kyrgyzstan. In accordance with the report of the Kyrgyz Ministry of Finance (2018), the country has 3.8 billion USD of external debt. Around 45% of this, which is 1.7 billion USD, belongs to the Export-Import Bank of China. Within the "The Belt and Road Initiative"[29], the Chinese government announced several investment projects in road construction, urban development and energy in Central Asia. The Kyrgyz government is actively using this initiative to discuss opportunities for investment. China has already provided loans for projects such as the power grid "Datka – Kemin" and an alternative road connecting the north and south of Kyrgyzstan.

[27] Shanghai Cooperation Organisation (SCO) is a permanent intergovernmental international organisation, the creation of which was announced on 15 June 2001 in Shanghai (China) by the Republic of Kazakhstan, the People's Republic of China, the Kyrgyz Republic, the Russian Federation, the Republic of Tajikistan, and the Republic of Uzbekistan. Organisation currently also includes the Republic of India and the Islamic Republic of Pakistan. See http://eng.sectsco.org/about_sco/

[28] http://minfin.kg/ru/novosti/novosti/struktura-gosdolga-kr-po-sostoyaniyu-na-31-yanvary.html

[29] The Belt and Road Initiative is a global infrastructure development strategy of the Chinese government adopted in 2013. Originally known as the "Silk Road Economic Belt", later "One Belt and One Road", officially changed in English. See http://liia.lv/en/analyses/bri-instead-of-obor-china-edits-the-english-name-of-its-most-ambitious-international-project-532

Regional construction projects such as the "China – Kyrgyzstan – Uzbekistan" railroad, and the "Turkmenistan – China" transit gas pipeline are under the process of discussion. In 2013, the Kyrgyz and Chinese governments approved the agreement of a transit gas pipeline with a total length of 215 km in Kyrgyz territory[30]. The Chinese government encourages the use of gas as "cleaner energy" (Xinhua, 2018). Currently, China has the Central Asia – China Gas Pipeline system comprising three transit lines in parallel, each running for 1,830 kilometres. The system starts from Turkmenistan via Uzbekistan and Kazakhstan, and it is planned that it will provide more than half of the imported natural gas to China. In addition to this, China has announced the fourth pipeline, known as the Line D, which has a designated deliverability of 30 billion cubic meters[31]. This route takes a southern direction, covering Turkmenistan, Uzbekistan, and then goes through the mountain regions of Tajikistan and Kyrgyzstan. Despite the fact that mountainous relief creates some difficulties for construction works and a high cost of the project, geographically it is the shortest route to the Chinese border. Upon the operation of this project, China wants to increase the annual gas transportation from Central Asia up to 85 billion cubic meters[32].

Some analysts explain this as an objective of China to secure and to have an alternative route for stable gas delivery and to show that they are not dependent on some transit countries in the region (Lelyveld, 2017). In addition, multiple land routes will secure natural gas supplies, while maritime routes are perceived as vulnerable with possible external interference. Other sources have reported that this project has an environmental objective and aims to decrease the consumption of coal use that cause rising environmental issues in China, in particular carbon dioxide (CO_2) and sulphur dioxide (SO_2) emissions (Xinhua, 2018). Nevertheless, the "diversifying route" of China was planned to lay down the pipeline through the Alai Valley of Southern Kyrgyzstan. The project considered investment in the order of 1.2 billion USD for Kyrgyzstan with employment of up to 800 people for construction works and 200 permanent jobs, construction of a compression station, with an anticipated 2.5 billion USD in revenue from transit fees over the projected 35-year lifespan of the project. However, in early March of 2017 many media sources by quoting to Uzbekneftegaz, informed that the project was "postponed for an indefinite period". Later, in May 2017 the visit of the newly elected president of Uzbekistan to China increased the suspicion around the development of fuel related projects in Central Asia.

[30] Directive of the Government No. 373-p from 9 September 2013 available at http://cbd.minjust.gov.kg
[31] https://www.cnpc.com.cn/en/FlowofnaturalgasfromCentralAsia/FlowofnaturalgasfromCentralAsia2.shtml
[32] Directive of the Government No. 161-p from 16 May 2014 available at http://cbd.minjust.gov.kg

According to Sputnik (2017),[33] the two countries had signed contracts including oil and gas projects for 23 billion USD.

In June of 2018, during the state visit to China, the Kyrgyz President S. Zheenbekov signed several agreements including the pipeline project. It was announced that the republic would annually generate around 75 million USD as a transit fee on China. In accordance with a signed memorandum, the Hong Kong registered company, "Trans-Kyrgyz Gas Pipeline Company Limited", will manage the construction of the "D" gas pipeline. The company is a branch of "SINO-Pipeline International Company Limited" which is fully owned by the state-owned China National Petroleum Corporation. The company promises to employ local residents and has already launched recruitment among school graduates in the Alai Valley. The 30 selected students will study in China with the possibility to work for the company. So the earlier "postponed" project was changed to the mode of "planned". However political instability and events followed with the parliamentary election in 2020 and the new presidential election in 2021 causes delays to the construction works in Kyrgyzstan.

The postponement of the Line D gas pipeline construction is also affecting the environmental agenda of Kyrgyzstan. An anonymous official in the State Agency on Environmental Protection and Forestry has informed that the establishment of the new Alai Nature Park has been delayed due to this project.

In the case of realisation of the gas pipeline construction work, the landowners will receive compensation if the route goes through their land. In accordance with data provided by the Pasture Committee of Kashka-Suu aimak in 2015, within the Chong-Alai rayon, it will affect almost 495 hectares and 424 land users. In particular, for the establishment of the compression station, the company requires 19,53 hectares of land (of which 86% is arable land) for 35 years under a leasehold arrangement.

It is understandable now why the central government is postponing the establishment of Alai Nature Park. This is because the pipeline construction would have to comply with the provisions of a number of environmental laws including the Forestry Code, and the Law on Protected Areas. It seems likely that the establishment of the protected area will take place following the completion of the gas contract and probably with the exclusion of the pipeline route.

[33] Sputnik, 2017 http://ru.sputniknews-uz.com/politics/20170515/5409178/Mirzieev-itogi-vizit-kitai.html

Gold mine

In the economy of the country, industry provides over 17% of the GDP (NatStatCom, 2016a) and gold mining makes a significant contribution to this. Among the minerals produced, almost half is gold that comprises up to 45% of the value of the total exports from the country. In Soviet time, around 85% of the country was covered by geological surveys which identified more than 60 gold deposits. The industrial gold mining history started in 1986 with the Makmal gold deposit (Bogdetsky et al. 2005:12; Mineconom, 2014:13).

Since independence, the country has attracted foreign investment for the Kumtor gold mine[34], where commercial gold production began in 1997. However, later this mine had generated many environmental issues including cyanide contamination from an accident concerning a truck transporting cyanide, and the impact on glaciers next to the mining site.

The Kyrgyz "Law on Subsoil" (2012) regulates the mining sector, and the licensing procedure is the basis for the management of natural resources, with the sole exception being the concession agreement with the Kumtor Gold Company (Mineconom, 2014:37).

In accordance with the State Committee on Industry, Energetics and Subsoil Use of the Kyrgyz Republic, by 2018, there were 544 active licenses for exploration, search and development of gold. From this, 34 licenses have been issued for the Alai region[35].

In the Kashka-Suu municipality, the Mountain Investment Company "Kaidi" constructed a gold processing plant (Fig. 1.6). In addition, in the Alai Valley, there are several other Chinese companies including the Azia Gold Enterprise, the Xinjiang Huangjin Investment Co Ltd, and the Mountain Investment Company Aksyaltyn Xinjiang.

In accordance with the State Committee on Industry, Energetics and Subsoil Use of the Kyrgyz Republic, these companies have licensed sites in the Karamyk, Altyn-Mazar, Aidarbek, Kök-Suu, Kara-Kazyk and the Zhaman-Zher deposits. They were originally explored in the 1977-1989 period.

[34] Kumtor mine is one of the highest gold deposits in the world, at an altitude of 4,000 meters above sea level. Administratively it is located in Yssyk-Köl oblast, in the southern region of the Central Tien-Shan in a permafrost zone. It borders with the Sarychat-Ertash State Nature Reserve. The company plays an important role in the economy of the republic by contributing up to 10% of GDP, referred to as the largest taxpayer and employer. However, mining operations significantly had impacts on Sarytör, Davydov and Lysyi glaciers.

[35] See http://www.gkpen.kg

Figure 1.6 The gold processing plant operated by Chinese "Kaidi" company next to Kabyk village
Photograph: M. Anarbaev, 2015

In the Alai Valley, gold mine development actively started in 2008. However, after political events in April 2010, which resulted in the overthrow of President Bakiev, local people demonstrated against the operation of the factory, and it was temporarily terminated. The cause for the termination included the concerns among the local people that the factory was causing air pollution to the environment, and that hazardous wastes would be deposited close to the village. There was also a rumour that the company belonged to the son of the President at the time, being President Bakiev.

The year 2010 was controversial for the mining sector. Many companies stopped their works due to the demonstrations by local people. Even simple geological investigations were terminated. Fieldwork in 2015 showed that the residents of Kabak, Kashka-Suu and Achyk-Suu villages were dominantly supporting the continuation of the gold processing plant's operation. However, there was a strong resistance among the people of the neighbouring Chong-Alai municipality, especially Chak (Kök-Suu) village, where the deposit and open-cut mine is located. In comparison to other villages, Kara-Kabak village had a mixed attitude towards a gold factory. Indeed, they had a more complex issue in 2014 concerning a coal deposit on the northern side of the village (which had originally been investigated during 1971-1979) where a private company wanted to develop that mine. After some negotiation, the gold processing plant commenced operation, providing employment for around 70 persons. In addition, Kashka-Suu municipality annually receives 670 thousand som (9.5 thousand USD) through land tax.

Oil and gas

Kyrgyzstan has around eleven active oil fields and six gas fields (Mineconom, 2014:12). All of these are located in the Fergana basin. By 2020, the annual production of oil had reached 240 thousand ton and around 25 million cubic meters of gas[36]. These volumes are not sufficient to cover the domestic demand. Currently, five companies are involved in production, four of them with Chinese capital. In 2012, Australian "Textonic Ltd" and Canadian "South Derryk Ltd" sold out their dominant shares to the Chinese company "San Shian Yuan Ltd". In 2018 the Kyrgyz government held talks with the Russian company "Gazprom" on the purchase[37] of OJSC "Kyrgyzneftegaz", which is the main oil and gas producer in Kyrgyzstan. Earlier in 2014, Gazprom had purchased 100% of the shares of "Kyrgyzgaz" (nowadays "Gazprom Kyrgyzstan" Ltd). A government official has called this deal as "strategic" and is a long-term partnership with Russia. The first messages about oil and gas perspectives in the Alai Valley appeared in 1993. The Kyrgyz government issued the Decree "On Strengthening Oil and Gas exploration in the Alai Valley of Osh oblast"[38]. Several foreign companies, especially from China, announced exploration works in the Alai Valley. According to the Kyrgyz State Agency on Geology and Mineral Resources, the Alai, Aksai and Arpa valleys had been assessed with great potential (Trofimuk, 2002:61). In recent years, "Kyrgyzneftegaz" JSC and Chinese "Oil Gas Copmany Anbang" Ltd carried out exploration works in Alai Valley. The last works were affiliated with "China Congo Wing Wah Petrochemical Joint Stock Company Limited". Investigation and drilling works took place close to the Achyk-Suu village.

Besides being part of the Great Game in the nineteenth century, since independence, the Alai Valley, from the former peripheral region, became a challenging place from a strategic, socio-economic, geopolitical and ecological perspective by many interested parties. This vast territory historically was used and associated with pastoralism. However, its ecological potential and suitability for nature conservation and the available mineral resources of the region, attracts many external powerful actors. These interest parties influence the decision-making process of the socio-economic and environmental agenda of the country. Therefore, to investigate this region from the Political Ecology point of view could be beneficial so as to provide a better understanding of the broader picture. Because it combines many aspects, it is necessary to look at power relations, social changes and the political development factors within an historical

[36] Oil and Gas production (2020). See http://stat.kg/ru/opendata/category/86/

[37] See https://rus.azattyk.org/a/kyrgyzstan_kyrgyzneftegaz_gazprom_oil/29100924.html

[38] Government Decree 12.07.1993 No. 308 "On Strengthening Oil and Gas Exploration in the Alai Valley of the Osh oblast". See http://cbd.minjust.gov.kg/act/view/ru-ru/38592

dimension. All of these aspects are important to properly understand the pastoralist-predator relationship.

2 Political Ecology as an analytical framework

Political Ecology is the study of the relationships between political, economic and social factors with environmental issues and changes. The approach differs from apolitical ecological studies by politicising environmental issues and phenomena (Blaikie, 1995; Bryant and Bailey, 1997; Schmidt, 2008; 2009; 2013; Vaccaro et al. 2013).

The Political Ecology approach was applied via variety of contexts to emphasize human-environmental issues, such as people and national parks, forest, land degradation, mining, soil erosion and other types of natural resource use where the cross-over with interests or values has been taking place (Springate-Baginski and Blaikie, 2007).

The origin of the conceptual field goes back to 1970s and 1980s where it was widely used in geography and cultural ecology (Blaikie and Brookfield, 1987; Robbins, 2004). There are several sources referred to as the founder of the term 'political ecology'. Bridge et al. (2015) argue that the term was coined in French (Écologie politique) by Bertrand de Jouvenel in 1957 and in English by anthropologist Eric R. Wolf in 1972. Le Billon (2015:598) notices that the term Political Ecology first appeared within a leading geography journal through Bassett's (1988) study on peasant-herder conflicts in the northern Ivory Coast.

Primarily, Political Ecology has focused on phenomena in and affecting the developing world (Bryant, 1998; Bryant and Bailey, 1997). Nevertheless, the application of the Political Ecology concept is wide and applies in many other spheres of human activities including IT technologies, urban development (Bryant, 2015), climate change, natural hazards, public health and wilderness (Perreault et al. 2015; Vaccaro et al. 2013:255). Particularly the questions of wildlife conservation became the central analytical focus of Political Ecology over the last several decades.

2.1 Political Ecology as a conceptual approach in understanding conservation

Understanding the human-environmental relationship is one of the key research fields in social sciences. The high interest of political ecologists in conservation has resulted in a 'wave of articles' on various themes covering land degradation, parks and indigenous people, natural hazards, climate change and so on. Primarily, studies have focused on specific protected areas and people living around them because the attention of political ecologists was applied to the rapid extension of protected areas after the 1940s (Vaccaro et al. 2013). The number, scale and types of institutions, financial and political resources allocated in this sphere were under focus as well. Scholars contributed to the understanding of how the human-environment interrelationship changes, and how natural resources are used, impacted and shaped by people

over time (Neumann, 2015:391; Schmidt, 2009; Vaccaro et al. 2013). The special chapters on conservation became a part of textbooks and successive editions of Political Ecology (Bryant, 2015; Peet et al. 2011; Perreault et al. 2015; Robbins, 2004).

In his work, Neumann (2015:392) argues that the global expansion of protected areas has generated social and political conflict among a diversity of actors, mainly with local people dealing with agriculture, responsible state affiliated institutions, non-governmental organisations, and international governance institutions. The establishment of protected areas generates winners and losers, linking questions of social justice to conservation practices. Consequently, the increasing interest to investigate the cases depicts patterns of power shifts and management institutions over the available natural resources. In addition, this global tendency was termed as 'Land grabbing' (Visser and Spoor, 2011), 'Green grabbing' (Fairhead et al. 2012) or 'Green imperialism' (Vaccaro et al. 2013) and is considered as the result of 'Environmentalism' (Milton, 1993).

According to Jackson et al. (1996:241) the creation of protected areas, which serve as refuges for wild carnivores and populations in the surrounding areas, should be taken into consideration with regard to human-wildlife conflicts. The question is *how* the establishment of protected areas can impact on the dominantly pastoral livelihoods or the attitude of pastoralists towards biodiversity conservation in general.

Madden (2004:251) emphasize that behind each conflict situation there is a unique combination of social, cultural, economic, political, historical, biological, and geographic complexities. However, for governments of developing countries, wildlife associated conflicts might also be referred as the 'cost of protection'. People who make a living based on subsistence lifestyle experience a greater impact from wildlife. Their perceptions are likely different from those who are able to buy nicely wrapped food in shops (Peterson et al. 2010:79).

The last decades of the twentieth century showed significant changes in acceptance of the mountain environment, particularly in the environmental policy discourse. The national environmental policy particularly in many developing countries have been shaped and facilitated by the ratification of multilateral environmental treaties, such the Convention on Biological Diversity, the Convention on International Trade in Endangered Species of Wild Fauna and Flora, the Convention on Migratory Species and many others[39]. Consequently, this process has

[39] There are 196 member states which have joined the Convention on Biological Diversity, with the exception of the United States. The Convention on Migratory Species (or known as Bonn Convention) has 130 Parties by 2019. In the Convention on Migratory Species currently there are 183 Parties. See www.cbd.int

contributed to an increase in the number of powerful actors in the arena of biodiversity conservation.

One group of scholars (Brechin et al. 2003; Zimmerer and Basset, 2003) argue that new conservation geographies and worldwide expansion of nature conservation efforts are often interpreted as an achievement of modern global environmentalism. The global institutions supporting protected area conservation include various agencies of the United Nation system, particularly the United Nations Educational, Scientific and Cultural Organisation (UNESCO), the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP). Around the world there are more than forty mountain areas on the World Heritage List within the Convention Concerning the Protection of the World Cultural and Natural Heritage (Hart, 2008:8). Recently, in 2016, during the World Heritage Committee's 40th session the Western Tien Shan Mountains were included on the list as well.

Taking into consideration the crucial idea of political ecology is that ecological issues or conflicts are seen as the result of social processes. Therefore an analysis should focus on actors and their interests in natural resources, on their activities, and power asymmetries, socio-political contexts and institutions on different spatial and administrative levels (local, regional, national, international, global), and also historical preconditions (Robbins, 2004; Schmidt, 2008). For instance, collectivisation[40] and sedentarisation[41] changed not only socio-economic life in all corners of Kyrgyzstan but also affected the management of wildlife.

2.1.1 Political Ecology embedded in historical context

The Political Ecology approach considers the historical background of the topic as an important part of the research in producing sophisticated, critical analyses (Davis, 2015:264). The issue around predators was solved and organised differently and linked with the form of animal husbandry during the socialist era. Nowadays the way of tending livestock, managing grazing, and the keeping and ownership of livestock in Kyrgyzstan are different from the Soviet times. Therefore, to better understand this phenomenon it is necessary to look back into the history of pastoralism in the country. The concept of Political Ecology is keen to discover *why* this issue came up (Peet et al. 2011:25).

[40] Collectivisation was a state policy of the Soviet government of its agriculture implemented between 1920-1937. The policy aimed to integrate individual peasant and pastoral households into collective and state farms.

[41] Sedentarisation was a state program of organised settling of mobile pastoralists into permanent settlements.

Historically the mountain regions of Kyrgyzstan were perceived differently in various periods. They were a crossroad, and peripheral, and in the nineteenth century they were a frontier zone in the struggles for dominance between superpowers in Central Asia (Kreutzmann, 2015; 2016b). In addition, historically, mountains were home to many endemic species and considered as 'evolutionary engines' and biodiversity hotspots. These regions are the home of diverse people and cultures as well (Grabherr, 2000:28). The highland pastures in Kyrgyzstan are highly valued by pastoralists with their traditional nomadic culture. People of mountain regions are dependent on natural resources and are in direct contact with the wildlife living there. This interaction was always under attention, consequently shaped and altered during various political and socio-economic regimes.

2.1.2 Political Ecology in respect to human-wildlife interaction

Human–wildlife conflict has traditionally been viewed to occur "when the needs and behaviour of wildlife impact negatively on the goals of humans or when the goals of humans negatively impact the needs of wildlife" (Madden, 2004:248). A variety of wildlife species come into conflict with human interests (Sillero-Zubiri et al. 2007; Woodroffe et al. 2005), the effects of which are serious and well documented in the case of large mammals (Acharya et al. 2016; Inskip and Zimmermann, 2009; Linnell and Alleau, 2016; Marchini and Macdonald, 2012). These studies emphasise visible impacts of human-wildlife conflicts such as human safety, crop damage and livestock loss. The effects of such impacts penetrate far deeper than immediate threats from wildlife. However, most attempts to examine human-wildlife conflict and policies to mitigate it gravitate toward visible aspects of the issue (Sangay and Vernes, 2008; Treves, 2009; Woodroffe et al. 2005). Human-wildlife conflict attracts attention when the wildlife species are endangered or where the conflict poses a serious threat to human welfare (Mishra et al. 2003; Saberwal et al. 1994; Takahata et al. 2014).

The mountain territories of Central Asia are an important habitat for snow leopard and wolves, and for their main natural prey species, the argali and ibex. In Kyrgyzstan and elsewhere like China, Mongolia, Tajikistan, Pakistan and in the countries covering the Himalayan region, such areas have also long been used by local farmers for grazing their livestock. In communities with a subsistence economy even small losses can be of economic importance, and this can generate negative attitudes towards wildlife and conservation in general (Mishra, 1997; Lescureux, 2006). The government of Kyrgyzstan permits trophy hunting of some wild animal species and human activity increasingly threatens wide-ranging wildlife populations (Watanabe et al. 2010).

Izumiyama et al. (2009) discussed that Kyrgyzstan faces the problem of large carnivore prey depletion, which has created international concern, although few detailed studies on wildlife management in Kyrgyzstan are available to validate the extent and effect of the depletion.

2.1.3 Political Ecology and animal husbandry in mountains

The high interest in mountain regions since the 1980s is evident from the number of publications on human and mountain environment interrelationships and the multidisciplinary approach which has been applied (Badenkov, 2017; Kreutzmann and Stadel, 2000). The mountains, taking into account their altitude, climatic features, water arteries, vegetation structures, geologic formations, along with their various mineral resources and suitable habitat for pastoralism, leads to a high diversity in the ecological environment. Services and products that come from nature are valued and appreciated because of human needs.

Over the last decades, there has been a high interest of scholars in animal husbandry of post-socialist Kyrgyzstan and its relationship to environmental issues. Several monographs also were designed to explore the complexity of human-environmental interrelationships in the context of forestry (Schmidt, 2013), pasture resource utilisation (Dörre, 2014) and agro-pastoral livelihoods (Steimann, 2011). Another aspect of the human-environmental interrelationships is wildlife management in the context of conflicts between pastoralists and predators. With specific regard to rural Kyrgyzstan, pastoralism is a significant means and income source of local livelihoods, so this becomes an important issue.

Governance of pastoral lands and existing pastoral systems in mountain regions is under the special interests of the academic community, conservationists and policymakers (Hannam, 2018; Kreutzmann, 2012). Particularly in Kyrgyzstan, processes such as privatisation of agricultural land, and the dissolution of collective and state farms has led to changes in the governance of pastures. Wildlife conservation experts highlight the importance of the knowledge on livestock grazing practices, tending, keeping facilities and approaches that is used by pastoralists. For instance, in the Pamirs of Tajikistan and Afghanistan, in India and Nepal within the Himalayan Mountains, various means such as roofed corrals, lighting in the night, using dogs and other solutions are recommended to mitigate or avoid livestock losses by predators (Mishra et al. 2016; Rosen et al. 2012). Therefore, better understanding of pastoralism in mountain regions from a Political Ecology perspective, can provide more insight into the human-wildlife conflicts.

2.2 Political Ecology as a conceptual framework

> The Kyrgyz Republic is a party of thirteen international environmental treaties and conventions, the implementation of obligations under which contributes to support ecological sustainability and allows to attract external grant funds…
> National Council for Sustainable Development of the Kyrgyz Republic (2013:53), own translation

According to Bridge et al. (2015:12) the central questions in Political Ecology are organised around five fundamental analytical concepts:

1) Environmental knowledge by asking the question: *How do we come to know nature?*

2) Environmental change: *In what ways are nature and society transformed through economic activity?*

3) Environmental governance: *Through what sorts of social arrangements and forms of rule do people "manage" nature, and to what effect?*

4) Environmental identities: *How are social subjectivities shaped through, and reflected by, differential access to and control over nature?*

and 5) Environmental politics or agenda: *In what ways and for what reasons do people mobilize politically around nature and natural resources?*

Regarding the debates around wildlife conservation, particularly in the context of human-wildlife conflicts, this thesis decrees that the most important thing is asking the question of environmental politics and governance in relation to the socio-economic agenda (Fig. 2.1). It is widely recognised that nature conservation measures are only possible and are directly dependant on the sustainability of the country in a socio-political context (Hanson et al. 2009).

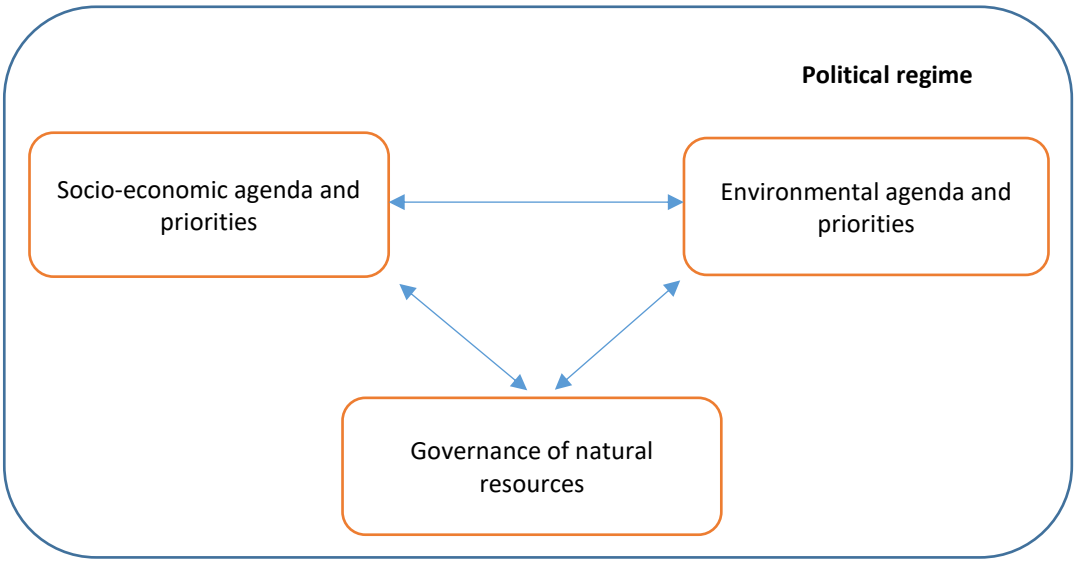

Figure 2.1 Interdependence of socio-economic, environmental agendas and governance of natural resources

Moreover, a political regime may directly shape the socio-economic and environmental priorities of 'space utilisation', and accordingly may lead to changes in the responsible institutions and structures for natural resource management.

This thesis starts with the assumption that the governance of natural resources is under the interdependence of socio-economic and environmental agendas. These agendas or use of space and resource utilisation priorities are strongly shaped by the political regime (Schmidt, 2012). Consequently, they affect the framing and development of regulations on the one hand and the users and responsible institutions for management on the other hand.

For a long time, agriculture, especially pastoralism has been the significant source of livelihood of rural Kyrgyzstan. Accordingly, many people make a living from pastoralism by using natural pastures. On the one hand conservation efforts to restore wildlife and protect their habitats is growing, confrontation and contact between humans and wild animals is intensifying on the other hand. Therefore, the human-wildlife conflict is a major issue in sustainable rural livelihoods and nature conservation. It is also recognised that economic impacts can be very intense on a local level, where wild predators may have serious impacts on rural livelihoods (Lescureux and Linnell, 2013). Traditionally, people reacted to these conflicts by killing wild animals, and this led to the extinction of species in their habitats or to their endangerment. Human-wildlife conflict has been the subject of administrative, institutional, and legislative arrangements for many decades in Kyrgyzstan, particularly in relation to animal husbandry during socialist era.

There are a number of studies done about wildlife related conflicts. It is widely recognised that human-wildlife conflicts hinder many factors in the ecological, economic and social context. Many papers often look at this conflict from the point of view of one of these angles (White et al. 2009) covering mainly competition for food or habitat with livestock and solutions for coexistence (Bagchi et al. 2004; Johansson et al, 2015; McCarthy and Mallon, 2016; Mishra et al. 2004; Woodroffe et al. 2005). However, little attention is given to the political, institutional and legal regulations, historical background of interrelationship between human and nature. More than ten years ago a group of scholars (White et al. 2009:245) developed the integrated conceptual framework to understand biodiversity conflicts. However, the approach does not cover or include the influence and interrelationships among the different actors.

In recent history, Kyrgyzstan has lived under two different socio-economic systems, which have dramatically shaped rural livelihoods and altered human-wildlife interrelationships. Since independence in 1991, animal husbandry has shifted from the collective and state-controlled system to private ownership (Anarbaev, 2018). At the same time, wildlife management has

become detached as a separate sector of the economy by introducing new institutional and legislative settings to the country. Therefore, the historical dimension should be considered in conjunction with the former and existing legal and institutional framework.

Given the complex structure of interrelationships and interlinkages in the context of pastoralism and predators in the Alai Valley and given the historical dimension in a setting that has experienced two major socio-political transformations during the twentieth century alone my analytical concept will be based on a four-pillar approach (Fig. 2.2) as suggested by (Springate-Baginski and Blaikie, 2007:9).

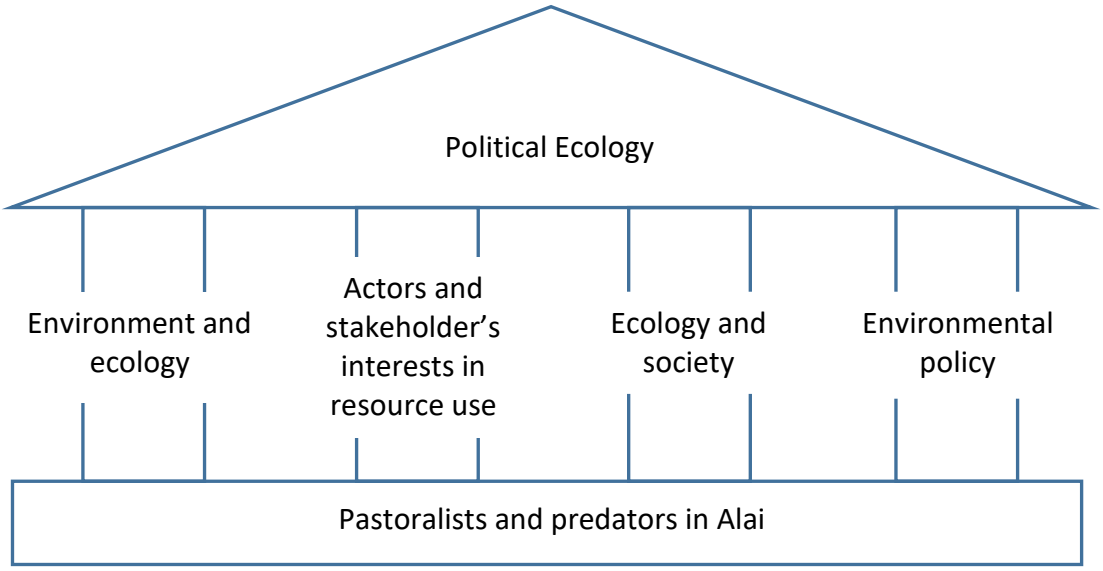

Figure 2.2 Application of four-pillars of Political Ecology approach

Accordingly, the *first pillar* is devoted to the understanding of concerns from the biophysical ecology or environmental science point of view. Wild predators are considered as a keystone species, as an essential component for healthy functioning of ecosystems, and in another interpretation, they are associated with the term 'regulatory species' where the animals generate environmental benefits. In socialist time, some wild predators were classified as vermin or pest animals. Therefore, looking at outcomes from the application of this concept within the historical dimension is beneficial for better understanding of the issue. In the *second pillar*, the concept of political ecology provides the structural positions of various actors with their access to control or manage natural resources, for instance access rights to the Protected Areas or wildlife management, with an explanation of *who benefits* and *who loses.* The changes in regulations affects local people's livelihood directly or indirectly and it is necessary to understand who gains what. The *third pillar* devoted to the dialectic debates between ecology and society. The role of

the expansion of green movement ideas, or environmentalism, and its impact on society should be explored. As well as how these debates contribute to the general human-wildlife relationship. The *fourth pillar* describes how environmental policy came to be and how different actors interact between and influence each other and arrive at decisions regarding the utilisation of resources (Springate-Baginski and Blaikie, 2007:11). Moreover, it gives more insight into how environmental policy has changed over time.

2.3 Application of Political Ecology as a conceptual framework for analysing human-wildlife conflicts

Nowadays, Kyrgyzstan is party to thirteen international environmental agreements and conventions. Highlighting ecological problems or nature conservation issues is a requirement of various national strategic documents which enable the government to receive financial aid from international external sources. The State Agency on Environmental Protection and Forestry (2009:72) reports that international donors finance most of the wildlife conservation activities and environmental projects undertaken in Kyrgyzstan. Annually around 10-30 million USD is attracted as investments for ecological projects through various development agencies, which subsequently makes them party to the national environmental agenda development process. The Republican Fund for Nature Protection and Forestry Development was established by Decree of the President of Kyrgyz Republic in 2006. This fund accumulates penalties from ecological damage and payments for the use of natural resources including hunting. However, the size of the fund only allows the implementation of comparatively small-scale activities, so supplementation is required from external sources.

The main activity of the State Agency for Environmental Protection and Forestry under the Government of the Kyrgyz Republic aims at establishing and developing cooperation with international organisations and foreign countries, as well as attracting grants and technical assistance in the field of environmental protection and sustainable use of natural resources.

The overall goal of the present work is to better understand the interrelationship between pastoralism and wildlife management in rural Kyrgyzstan with the aim to know more about the question *why* issues relating to wild predators have become a serious concern of pastoralists in recent decades. To understand this it is necessary to look through the historical dimensions, specifically the Soviet legacy, and how particular rangelands and wildlife resources are used and managed, how utilisation regimes evolved through socio-economic, political and environmental agenda, and which are altered by social and decision making institutional structures.

By taking the example of environmental change as a case study of the human-wildlife conflict in the Alai Valley of Kyrgyzstan, the thesis aims to understand the issue through looking at the web of actors such as resource users and regulating institutions and their interests over the historical dimension and environmental discourse (Schmidt, 2008; 2009; 2013). Furthermore, relatively little social science research has been focused on the human-wildlife topic in Kyrgyzstan.

Thus, the interest of nature conservationists and pastoralists needs to be understood from the perspectives of political ecology, and their interests, role and influence on the environmental agenda. This study aims to better understand the contested commons between protected areas, wildlife management on the one side and pastoralism on the other. The research attempts to explore this issue through focusing on the human-wildlife conflicts by examining the 'environmental discourse', political, institutional and social changes over the socialist and post-socialist periods of Kyrgyzstan.

At the same time of being a home for biodiversity, mountains are place of several human actors. They utilise specific features of mountains, their natural components and products for various purposes. Therefore, the conceptual framework as depicted in Figure 2.3 is applied to Kyrgyzstan to clearly show that human-wildlife conflicts hinder many and various actors are involved, with their diverse interests, values and power.

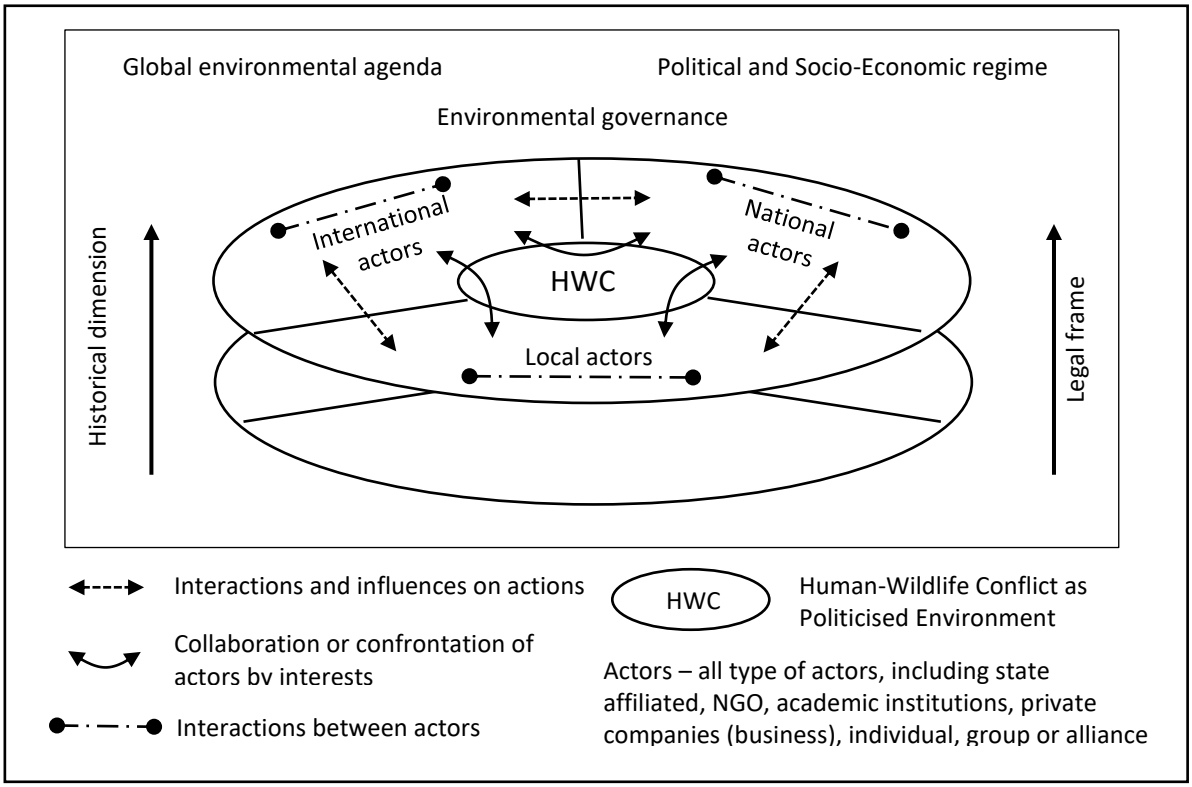

Figure 2.3 Conceptual framework for analysing human-wildlife conflicts
Design: M. Anarbaev

Treves and Karanth (2003) argue that the conservation of predators depends on the social and political environment rather than the biological landscape. Accordingly, an analysis of changes in the political agenda and socio-economic regime are important components to better understand the issue. This is because it may significantly shape the legal framework of predator management or acceptance of human-wildlife conflicts. It is necessary to analyse institutional and legal regulations on local, national and international levels and their transformation over the socialist and post-socialist periods of Kyrgyzstan from an actor-focused point of view.

Human - wildlife conflicts become more severe when there is an overlap between natural habitat used by wildlife and human economic activity. This overlap is also expressed as competition for space and resources. Because the space for pastoralism and wildlife habitat is limited, usage and management, including access rights, are altered and shaped by power positions. This creates an environment for different concerns and utilisation strategies where actors can negotiate, and interact (directly or indirectly), go for confrontation or collaborate with each other, struggle for power and adopt diverse means to gain influence (Schmidt, 2008).

Consequently, to more effectively understand the conflict between pastoralists and predators there is need in the theoretical framework which places the HWC as a Politicised Environment at the center of attention. The scope of actors' interests is wide-ranging and differs over time. Depending on utilisation priorities and needs, in different times these mountain territories as a resource and space were managed from the point of view of socio-economical, geopolitical, cultural, environmental and recreational concerns (Schmidt, 2008:139) and all of them are associated with actors. Blaikie (1985:81) describes them as 'place-based' actors such as local people that live there including local institutions functioning in an arena of interests and 'non-place-based actors' or 'non-location specific networks of economic social and political relations' influencing the institutions involved in governance, and affecting the issue and users of resources.

The research starts with the assumption that, since independence, the organisational, legal and institutional settings of animal husbandry and use of the wildlife resource have faced change. As a result, the 'human-environment interaction' is characterised by a variety of actors, known as governmental and non-governmental, international and national, regional and local, formal and informal, state and private business and other 'based' and 'non-based' actors (Blaikie, 1985; Dörre, 2014; Schmidt, 2009; 2013). To understand this complex issue, it is necessary to approach it from different historical, socio-economical, environmental and political perspectives.

Therefore, the Political Ecology as a conceptual framework is designed to improve the understanding of social and environmental changes, shifting power relations, human-environment interactions and livelihood issues. As the first objective, the study examines institutional and organisational settings in which rural livelihoods were interrelated and in cooperation with wildlife management in the socialist and post-socialist era, by taking into account the historical perspective of the region. The thesis also considers the institutional transformations in the human-wildlife arena since independence. The transition phase and adopted political institutional reforms in Kyrgyzstan offered people many hopes for a better life, but they also have created many 'uncertainties' (see Steimann, 2011). Post-socialist Kyrgyzstan, in following international practice, has established in 1996 a separate Ministry of Environmental Protection whereas before, the function of wildlife regulation and management was under the jurisdiction of the Ministry of Agriculture.

The second objective is to explore the current rural livelihoods in mountainous regions of Kyrgyzstan and related socioeconomic processes affecting them. Agriculture is considered as one of the significant human activities, which modify and affect the natural environment. Moreover, "the acknowledgement of pressing problems in high mountain regions has affected the development of high mountain research to such an extent that in recent years a shift of focus has been observed – people living in mountain habitats have been identified as the major actors in changing the natural and cultural landscape [...]. Consequently, when [nature conservation] is discussed [...], the role of mountain peoples in this process needs special attention" (Kreutzmann and Stadel, 2000:85). Therefore, the question of *how* rural mountain pastoralists make a living today is one of the core research questions.

Conflict between pastoralists and wild predators has a long history probably since the first domestication of animals by humans (Breitenmoser et al. 2005:49) and has been in the sphere of interest of local people and the state based on resource and space utilisation priorities. Therefore, the historical context on how space and wildlife resources are managed should be considered by asking the question how animal husbandry and use of wildlife resources use was organised in socialist era.

By exploring these questions, this thesis attempts to understand and explore insights of the interrelationship between wildlife and pastoralism. In addition, the question of how have institutions and organisations responsible for animal husbandry and wildlife management changed since the late socialist period will show power shifts and provide insights to explore the

main research question of what were the causes for increase of human-wildlife conflict, particularly livestock depredation by large carnivores.

This research aims to understand the status of depredation on livestock by wild predators by looking at the case study in Southern Kyrgyzstan. It will explore its linkages with livelihoods of pastoralists and with wildlife conservation concerns and ongoing debates around this issue in the country. The project design emphasizes the different utilisation strategies for the same rangelands providing fodder resources, wildlife habitat, livestock grazing and other uses.

2.4 Research question

Human-wildlife conflict is a major issue in sustainable rural livelihoods and nature conservation. This problem covers many wild species and many circumstances (Dickman, 2010). Even iconic and endangered wild species may have serious impacts on rural livelihoods and human lives. While sharing the same habitat, conflicts are predicted to increase globally (Kansky and Knight, 2014:94). Pastoralists in Kyrgyzstan are dominantly facing livestock depredation issues related to large predatory mammals such as wolves, jackals, snow leopards, bears and lynxes. Traditionally, people reacted to these conflicts by killing them, and this led to the local extinction of some species such Turan tiger, red wolf in their habitats. Decline of their population numbers have resulted in their endangered status and to be listed under the protection of the government (Anarbaev et al. 2019).

To better understand people's livelihoods, it is necessary "to look not only at *what people have*, but especially at *what they do*" (Steimann, 2011:42).

Therefore, the study pursues the following research questions:

- *How rural households make a living today?*
- *How recently adopted legislation in pasture management, hunting, biodiversity conservation shapes human-wildlife interaction?*

From an ecological viewpoint, 'competition between living organisms' is considered as a fundamental concept (Butt and Tumer, 2012), and, in this regard, there has been many studies on the competition between livestock and wild ungulates over resources (Mishra, 2001; Mishra at al. 2004; Shrestha and Wegge, 2008). They have been classified as dietary competition or habitat overlap. From a geographical viewpoint this habitat has been seen as a space utilised by humans (Kreutzmann, 1996:173). Moreover, Steimann (2011:44) highlights the importance of

historical perspective in social studies to better understand *transformation*, *institutional change*, *organising practices*, and *livelihood trajectories* that appears in the research.

Therefore, it is necessary to pose a further two questions:

- *What was the historical change of the use of natural resources in Alai and*
- *How have these changes impacted on wildlife?*

As discussed above, the establishment of new protected areas also plays a crucial role for human-wildlife interrelations, as perceived as refuge for wildlife. Thus, the conflicting and cooperating interests of different actors about wildlife, pastoralists and hunters on the one side and wildlife conservationists on the other – need to be understood from the perspective of Political Ecology.

- *How does the global environmental agenda shape conservation policy in Kyrgyzstan?*
- *How the establishment of new protected areas can influence local livelihoods?*

In recent years the increase in livestock depredation by wolves has become a primary socio-economic issue in the Tien-Shan and Pamir-Alai Mountain regions of Kyrgyzstan. The local pastoralists claim that livestock losses due to wild predators were lower in Soviet time than nowadays. In the Soviet times, the issue of 'wild predator' was centrally governed, and under the collective farm system, guns and ammunition were supplied to herders. However, environmentalists consider that the problem is linked with overhunting and poaching of wild ungulates such as argali and ibex (Koshkarev, 1989). Consequently, the number of natural prey species of the wolf and snow leopard has decreased. Traditionally the Kyrgyz nomads used eagles and the Kyrgyz sighthound dogs as a means of hunting and protection against livestock losses. During the socialist period, most of these traditional means were replaced with centralised and modern measures (Lescureux and Linnell 2013). Therefore, the following questions should also be addressed:

- *What were the causes of the increase of livestock depredation by large wild predators since independence?*
- *What are the traditional measures to protect livestock from depredation?*

In addition, special attention should also be given to the question of:

- *How recently adopted legislation in pasture management, hunting, biodiversity conservation shapes human-wildlife interaction?*

To understand the complex of human-wildlife relationships, a case study approach was chosen. The case study, conducted in the Alai Valley, addresses the problem from the historical, economic, social**,** political and environmental perspective.

2.5 Research design and methods

The study was designed to take place over four years. Fieldwork for this study was conducted over a period of four and half months, in the summer 2015 and winter 2017, with an additional short field visit in the autumn of 2018. The decision to divide the fieldwork into several parts is due to the seasonal character of human-wildlife conflicts and pastoralism. This seasonal approach enables a better understanding of pastoralism, its seasonal demand for domestic labour, crop cultivation, and the linkages to migration and hunting.

The process of data collection and analysis was iterative. Participation in workshops and seminars and presentation of results within colloquium ensured validation of data and results. The following table sets out the research steps of the study (Table 2.1).

Table 2.1 Research timeline with the three main phases of data collection and processing

FIRST PHASE	SECOND PHASE	THIRD PHASE
Explorative research	Quantitative and qualitative research	Analysis and consolidation
- Literature review - Formalisation of research questions	- Selection of case study site - Key informant interviews - Life history interviews	- Quantitative and qualitative in-depth analysis
- Preliminary fieldwork - Design of research framework	- Data analysis - Presentation of preliminary findings - First publication	- Presentation and critical discussion of preliminary findings in colloquium - Preparing monograph for publication
Fieldwork June -September 2015	Fieldwork February 2017	Fieldwork October 2018
2014 (IV) – 2015 (I-IV)	2016 (I-IV) - 2017	2018 I-IV) – 2019 (I-III)

The first phase includes:

- A literature review with the focus on socialist and post-socialist transformation, concepts of institutions, livestock keeping, pastoralism, control of large predators

- Design of research framework including elaboration of Political Ecology as the theoretical framework.

- Data collection: on livestock herding and hunting practices, institutions in socialist and post-socialist Kyrgyzstan.

The second phase covers the research site overview survey. This initial study provides a quantitative overview of the socio-economic situation and qualitative data of households to ascertain which group is mostly under risk of livestock depredation by wild predators.

- Methods applied include short structured interviews with household representatives, formal and informal key informant interviews, focus group discussions, and participatory observation.
- Transfer of collected data into Geographic Information System (GIS).

The third phase considers the qualitative in-depth study of institutions and legislation that are relevant to pastoralism and hunting; special emphasis is given to the change or evolvement during the socialist and post socialist period.

- Methods applied include extended case study analysis, conflict analysis, key informant interviews and participatory observation.

- Data analysis, writing-up, discussion of findings and correlation with the conceptual approach.

Research aim and objectives

The research aims to better understand human-wildlife interrelation in connection with pastoralism and wildlife management in Kyrgyzstan. Wildlife related conflicts will be addressed to analyse the status of wolf depredation on livestock and to explore its linkages with rural livelihoods and wildlife conservation concerns in the republic. The project design emphasises different utilisation strategies for the same rangelands providing fodder resources, wildlife habitat area, livestock grazing area and other uses by humans.

The research design is based on a thorough analysis of studies in which conflict situations and wildlife-human interaction occur (Bibikov, 1985; Dörre, 2014; Hussain, 2003; Inskip and Zimmermann, 2009; Kreutzmann, 2011; Lescureux and Linnell, 2013; Mallon, 2013; Rosen, 2012; Schmidt, 2013; Steimann, 2011; Vyrypaev and Vorobyov 1983; Woodroffe et al. 2005). The identification of different actors, their interests and their political influence in a given setting is investigated in order to better understand the dimension of competition and conflict as well as the potential for conflict resolution.

This research considers the management of wildlife in Kyrgyzstan, especially snow leopard – wolf – livestock – wild ungulates linkages, and predator control measures by looking at the case study in the Alai Valley. The study analyses the existing mechanisms of large predator control strategies and livestock depredation mitigation by wild predators.

It explores the interactions between the pastoralism and the wildlife conservation and hunting economy, and the ways in which economic and social synergies might be created or exploited

more effectively for the benefit of economically marginal communities and endangered wild species.

Data collection

A variety of methods has been used, including the study of institutions, locating historical documents in archives, collecting statistical data, and applying a holistic approach as well as social research methods such as questionnaires, focus group discussions, and mapping, to collect data and information. The archival material includes reports from the National Academy of Sciences of the Kyrgyz Republic, unpublished reports and maps of different state agencies especially the Ministry of Agriculture, Food Industry and Melioration of the Kyrgyz Republic, State Agency on Environmental Protection and Forestry under the Government of the Kyrgyz Republic, as well as reports and archival documents of various Soviet organisations of the past.

Several field surveys were carried out in the Alai Valley including interviews with local residents such as hunters, pastoralists and administrative officers. In addition, GIS tools were used for mapping and visual representation of results.

3 Applying the analytical framework to the Alai Valley

The transition from Tsarist to Soviet rule was examined, mainly the early developments at the beginning of the twentieth century. The political frame and conditions are important as a structuring element reflecting significant external intervention in Central Asia. Political structuration was initially shaped by external actors. With Kyrgyzstan's independence administrative and legal authorities were transferred into national institutions. Nevertheless, trends and actions in present-day politics are significantly influenced by past experiences.

3.1 Political development of the region in historical perspective

The twentieth century started for the Russian Tsarist Empire with the Russian-Japanese war (1904-1905) and the First Russian Revolution (1905-1907). Later the country was involved in the First World War (1914-1918) as well as revolts in Western Turkestan (Box 3.1).

A complex set of interrelated international and national economic, political and social processes led to the February Revolution[42] of 1917 in Russia. The result of the revolution was the abdication of Emperor Nikolai II from the throne, termination of the Romanov dynasty from ruling and the establishment of the Provisional Government. The Government was an alliance of liberals and socialists who sought political reform. During the same year, the October Revolution[43] took place and brought the *bolsheviks*[44] *(*Rus*. bolshe – majority)* to power. Soviet authority started quickly to expand in major cities in Russia. However, in comparison to other parts of Russia, the political situation in Western Turkestan was different, which had experienced anti-Russian regime rebellions in 1916 (Kreutzmann, 2015:267). Despite that, in September of 1917, the executive commission of Soviets overthrew representatives of the Provisional Government in Tashkent, where the majority of the population was still under the influence of local feudal and religious leaders (Kozlovsky, 1928). The Turkestan Autonomy[45] had a short life and in May 1918 within the Russian Soviet Federative Socialist Republic (RSFSR), the Turkestan Autonomous Soviet Socialist Republic was established.

[42] The February Revolution actually happened in March according to New Style. The revolution was known as such because Tsarist Russia used the Julian calendar at that time, which was changed to Gregorian in 1918 under the rule of the Soviets.

[43] Same as above, the name October Revolution remained in use while, according to the new calendar the 7th -8th of November became a holiday. Celebration commenced in 1927 on the ten-year anniversary of the Revolution. Nowadays these days are still a holiday in Kyrgyzstan.

[44] The radical wing of the Russian Social-Democratic Labour Party after its split into the factions the "Bolsheviks" and the "Mensheviks". Until 1952 it was equal with term of "Communist".

[45] Also known as Kokand Autonomy, as Kokand city was capital.

Box 3.1 Ürkün – uprising and exodus

In the middle of 1916, Turkestan became a hotbed of dissatisfaction of colonial policy. Uprising started on the 4th of July in Khodzhent of Samarkand province, and then spread to other cities of Fergana and Semireche (Kyr. and Kaz. *Zheti-Suu* – Seven Rivers). By August, most of the Fergana valley had quickly settled down. However, in the north of Kyrgyzstan, rebellion followed with dramatic consequences known as *Ürkün* (verbatim – stir, mass flee). A tragedy of the exodus was well described in Kasymaly Baialinov's novel "Azhar" (1928). The main reason was that population was against the mobilisation for labour work of the army's needs. However, other sources also indicate that the real reasons were economic and political, about land, unfair colonial regulations and supportive decisions towards Russian immigrant peasants (Broido, 1925; Budyansky, 2007; Zima, 1959). Tsarist administration suppressed the rebellion with punitive Cossack expeditions. This resulted in a massive flee of Kyrgyz people to Eastern Turkestan (Xinjiang, China) to seek asylum. People lost their livestock, land and other assets. Most of them died on the way, with a decline in half of the Kyrgyz population in Northern Kyrgyzstan (Usenbaev, 1982:131). The majority of the people that fled as refugees returned after the establishment of Soviet rule. On 3 February 1920, the Turkestan Republic issued a decree about resettling them, back in the areas where they had previously lived. The government returned the lost lands and other assets, offered financial loans and agricultural tools for refugees. By April 1920 according to a Special Commission, around 300 thousand Kyrgyz and Kazakhs returned to Semireche (Dzhunushaliev, 2003:118-119). In 1922, the government relieved refugees from paying the agricultural tax for the following five years (ibid:124).

The establishment of Soviet power in the territory of present-day Kyrgyzstan was different from place to place. In the beginning, the Soviets took over the rule of the mining cities Sülüktü and Kyzyl-Kyia of the present Batken oblast of Southern Kyrgyzstan, where the workers were supportive. The first Council of Worker Deputies (Rus. *Sovet rabochikh deputatov*) was established on 6 March 1917 by miners from these cities (Usenbaev, 1982:131).

Due to complex interests of various groups and states, Russian Turkestan became a theatre of endless local wars. Despite the fall of the Emperor and his family, some parts of his army called *belogvardeitsy* (white guards), were still fighting against *krasnoarmeitsy* (red soldiers) and Civil War continued until the 1920s (Toktomushev, 1982:140). With the aim of neutralising the powers in Turkestan and to establish Soviet rule, in 1919 the Turkestan Front was created. Acting as the

Red Army Commander, Mikhail Frunze played a key role and later his name was given to the capital (1926-1991) of Kyrgyz Soviet Socialist Republic.

3.1.1 The Soviet authority in the Alai

By the early 1920s, the Soviets took control of almost the entire country. The Red Army quite quickly achieved success on the western front and the Caucasus with the exception of the Russian Far East and Central Asia. The process of establishment of Soviet authority in Turkestan stretched for many years. In the Fergana Valley, the Soviets had come to power by 1920, but the Pamir-Alai and other Southern parts of Turkestan were still under the control of *basmachy* (Box 3.2). On 7 May 1920, Commander Mikhail Frunze ordered the mobilisation of local people by the Red Army of Turkestan and they moved to neutralise opposing *basmachys* in the Pamir-Alai. Combat with partisan *basmachys* in Central Asia took the longest time to establish overall control, particularly on the southern border regions where it took almost 15 years from the commencement of the revolution (Baktygulov, 1986:41). The Red Army fought against this movement until the end of 1935 especially in the Soviet-Afghan frontier areas. The last battle recorded in the territory of present-day Kyrgyzstan was in the Alai Valley, around the Erkechtam[46] border outpost in November of 1931 (Piskunov, 2000).

Box 3.2 Basmachy

This partisan movement was named in Russian as *basmachestvo* and originates from the Turkic word *basmak* – assault, attack. The members are known as *basmachy* and the plural is *basmachylar* in Kyrgyz language. Fights with this armed anti-Soviet movement continued until the end of 1930s. The total collectivisation campaign in the south of Kyrgyzstan resulted in a new wave of resistance. In addition, it was affected by support from external players in the region at that time. In the Soviet era, the literature, especially in cinematography, *basmachy* has a negative image and presented as a bandit- counterrevolutionary stealing livestock and food from peasants during the struggle for the strengthening of the Soviet power in Central Asia. After independence, this movement, and the reason of this struggle, came under the consideration of many scholars.

[46] According to Umurzakov (1982:95) the original name and spelling is Erkech-Tam. As a rule, the word *erkech* means horned goat that leads a herd of sheep, but also refers to large flock in the Kyrgyz language. The word *tam* is house. Hence Erkech-Tam verbatim – house with large flock.

During this 'recovery' period, land-water reform was introduced. However, agricultural assets such as land, was in the hands of *bai-manaps* (local feudal) and *kulaks* (rich peasants, who used hired labour). Under the leadership of local *bolsheviks* in May 1917 the Kyrgyz Democratic Union *Bukara* (commoner) was established. Later in 1921 this union became the basic platform for the mass organisation *Koshchu* (plowman) to support the realisation of the land-water reforms and by 1926 it had in the order of 56 thousand members (Dzhunushaliev, 2003:91).

3.1.2 Agricultural reforms in the 1920s: The collectivisation and sedentarisation campaign and its achievements

In Kyrgyzstan[47] the Land-Water Reform (Rus. *Zemelno-vodnaya reforma*) started in the winter of 1920 and occurred in two main phases, during 1921-1922 and in 1927-1928. The first phase took place, mainly in the Northern part of the country (Fig. 3.1) and was implemented under the slogan of the struggle against the big landowners (Dzhunushaliev, 2003:120). The Soviet Turkestan experienced the same scenario of collectivisation by methods used in other parts of the Soviet Union (Kharin, 2002:66). However, due to the environmental, social-economic, and cultural differences, this process occurred with varying characteristics in different parts of the country.

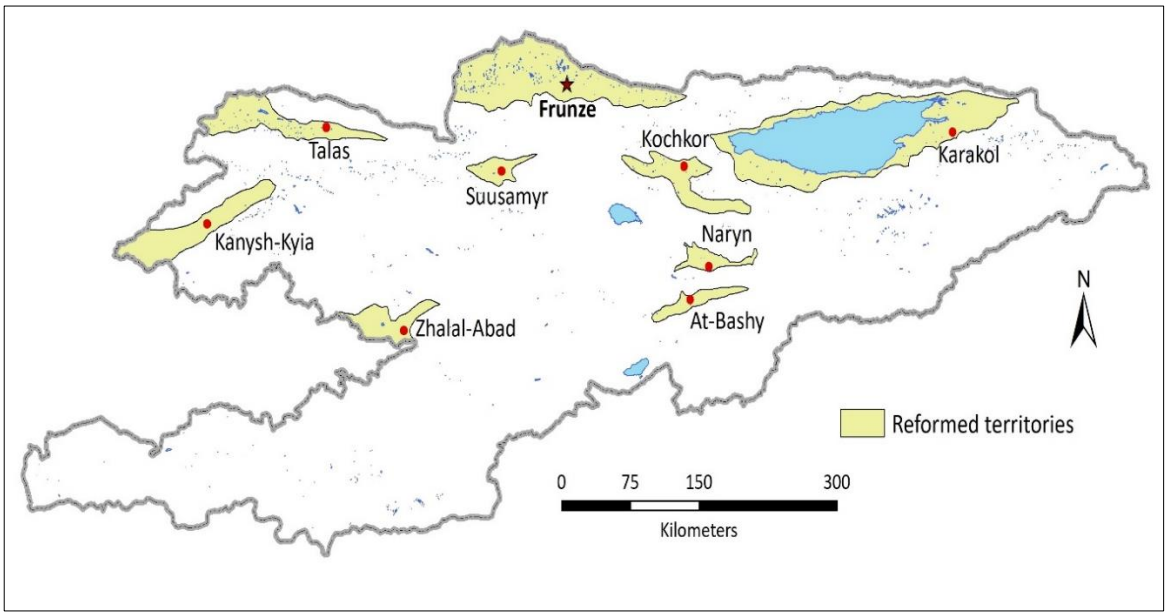

Figure 3.1 Land-water reform in 1921-1922
Source: Based on Dzhunushaliev (2003:119-121). *Cartography:* M. Anarbaev

[47] In that period, the country was the Kara-Kyrgyz Autonomous Oblast within Russian Soviet Federative Socialist Republic (RSFSR). The "Kara-Kyrgyz" here refers to as the "genuine", "real" or "true", not "Black-Kyrgyz" as has been mistakenly suggested by some scholars. It was used to distinguish with the *Kyrgyz-Kaisak* (Kazakh) (see also Shahrani, 2002:50). In addition, the word "kara" also in use to express "big" or "main", for instance *kara köl* – big lake, *kara buura* – big male camel, *kara sai* – wide big river, *kara kum* – big desert or *kara zhol* – main road, and many others (see also Watanabe et al. 2013:115).

For example, in Kyrgyzstan and Kazakhstan where dominant population were semi-nomadic and nomadic pastoralists, the collectivisation happened along with the sedentarisation campaign. In the North of Kyrgyzstan, the reform started with the establishment of permanent settlements, as a result in the Przhevalsky *uezd*[48] 346 households were organised into 22 settlements. In the Pishpeksky *uezd* there were 30 settlements formed from the 1,475 households (Malabaev, 1982:145).

Peasants were divided into several categories where the names of each originate from Russian words.

- *Bednyak* – a poor man.
- *Serednyak* – middle or peasant with the average level of prosperity.
- *Kulak* – rich peasant who uses hired labour. In Kyrgyzstan, local feudal lords such as *manap*s, *bek*s and *bai*s (Kyr. *bai* – rich) were the equivalent of *kulak*s.

With the purpose of identifying the *kulak* farms, 285 land commissions were established. In addition, the commissions had the task to relocate (Kyr. *Sürgün*) and confiscate land, agricultural implements such inventory-tools, seeds and livestock (Rus*. Raskulachivanie,* Kyr*. Kulakka tartuu* – dekulakisation) (Chotonov and Abdrakhmanov, 2009:38).

Confiscated assets were distributed among the poor peasants. The government stimulated the settling down of nomads by allocating land, providing loans, inventory and seeds at the cost of the confiscated assets. Special attention was given to the former participants of the uprising in 1916, who had returned to their homes. By 1923 almost 6,000 farmhands (Rus. *batrak*, Kyr. *chairyker*) and poor households (Rus. *bednyak*) received around 200,000 *desyatin*[49] (218,000 hectares) of arable and pasture lands. Nomadic and semi nomadic households were slowly being settled (Malabaev, 1982).

The first collective farms began to be established in 1918, particularly in Pishpek[50] (present Chüi oblast) and Przhevalsky *uezd* (Yssyk-Köl oblast), as well as three agricultural communes, one partnership for joint cultivation of land known as TOZ (Rus. *Tovarishestvo po sovmestnoi obrabotke zemli*) and one agricultural artel (Rus. *Selskokhozyaistvennaya artel* - agricultural cooperative) (Box 3.3). In accordance with the directives of the Central Executive Committee of

[48] District, part of oblast.

[49] The unit of area, equal to 1.09 hectares.

[50] An old name of the present-day capital city, Bishkek. Original settlement was formed at the place of *Pishpek Fortress* dated 1825. Between 1926-1991, it was known under the name of Frunze. By the Resolution of the Supreme Council of the Republic of Kyrgyzstan on 5th February 1991, No. 374-XII "About the restoration of historical name of the Frunze city" was renamed to Bishkek. See at http://cbd.minjust.gov.kg/act/view/ru-ru/50943/10?mode=tekst

USSR of 1923, cooperatives were voluntary-based organisations and all documents referred to the voluntary joining of peasants into cooperatives. In order to implement the directives from the top, some cooperatives were organised by force (Usenova, 2009). The collectivisation gave an impulse to local feudals to organise armed resistance *basmachestvo* and encouraged even poor peasants to fight against *bolsheviks* (Kharin, 2002:66).

Box 3.3 Forms of collective farms – commune, TOZ and agricultural artel

There were three forms of collective farms: the agricultural commune, association for joint cultivation of land (TOZ) and agricultural artel (cooperative). The main difference between them was the degree of collectivisation, the means of production, and income distribution. *Agricultural communes* were the dominant form until 1919, where all means of agricultural production (construction, tools and livestock) and land use were collectivised. The members have not undertaken individual farming. The communes were organised mainly on the lands of the former landlords and monastic lands.

The simplest and primary form of collective farm was the TOZ, where the land use and labour were collectivised. Draught livestock, machinery, inventory tools, and buildings remained in the private ownership of the peasants or pastoralists but shared among members. In some places, if a member was providing livestock, he was released from taxes for two years (Dzhunushaliev, 2003). Incomes were distributed depending not only on labour inputs but also on assets such as livestock or tools allocated for common use.

In agricultural artels the land use, draught animals, machinery, equipment, livestock and agricultural construction were collectivised. In private (individual) ownership were the house and subsidiary farm (e.g. garden and domestic animals) but its size was limited by the charter of the artel. In 1939-40, collective farms were shifted from TOZ form into artel and their function was based on a model charter of agricultural artels (Rus. *Primernyi ustav selskokhozyaistvennoi arteli*) (Malabaev, 1982:146) adopted in 1935 during the Second All-Union Congress of Collective Farmers.

Since 1940, artel was the main, and then single form of collective farm in agriculture. Subsequently, the name 'agricultural artel' lost its meaning, as in the legislation and in official documents the name "kolkhoz" was used, as well as in our modern understanding. This is reflected in the model charter of the kolkhoz adopted at the Third All-Union Congress of Collective Farmers on 27 November 1969 in Moscow. The key differences from the previous

charter such as elections, 'kolkhoz democracy', organisational structure and decision-making procedures were discussed in Lindner (2008) and Steimann (2011:105).

With the goal of supporting the establishment of a socialist form of economy and to provide a good model, the first famous cooperative from Czechoslovakia arrived in Pishpek. It was the cooperative *Interhelpo* established in 1923, Žilina (Slovakia) which was later nominated as the best cooperative of the Soviet Union. In 1925, the first train with 371 cooperative members and their machineries, devices and manufactories arrived. They introduced sugar beet cultivation and constructed a sugar processing plant, electric mill, turner shop, power station, textile fabric and tannery (Samuel, 1935:19). Later in 1933, Interhelpo even took under its patronage the kolkhoz Özgörüsh (ibid:58), which means in the Kyrgyz language "the change".
Dzhunushaliev (2003:155) indicates that in accordance with directives of *Kyrobkom* (Rus. *Kyrgyzsky oblastnoi komitet* – Kyrgyz oblast committee) from 1928, household categories were defined as follows:

- *Manap* – as economic unit not strong, but politically significant.
- *Bai* – an economically strong and influential pastoralist-landowner owning more than 200 sheep, and more than 35 head of cattle.
- *Serednyak* – owner of sheep and goats 20-200 head, 3-35 cattle.
- *Bednyak* – who owns 20-25 sheep, 3-4 cattle.
- *Batrak* – is a person who is working as a shepherd or servant with annual earnings of 50 roubles or owns six sheep.

In accordance with the state policy and approach to self-determination and national autonomy, during 1924-1925 the National-Territorial Delimitation (Rus. *Natsionalno-territorialnoe razmezhevanie*) in Central Asia (Rus. *Srednyaya Azia* – Middle Asia[51]) took place (Baktygulov, 1986:57; Dörre, 2016:102; Dzhunushaliev, 2003:94; Haugen, 2003:2). The borders experienced changes and corrections until 1936. The necessity of this historical event was formulated in the frame of core principles of the party's program on nationality issues, recognition of rights for self-determination, and establishment of independent national states (Nazarov, 1965:94). This task was given to Sredazbiuro[52] based in Tashkent. In addition, the bureau worked on other aspects of sovietisation of the region such as the nationalisation of land, irrigation, collectivisation,

[51] For the usage of the terms of Central Asia and Middle Asia, see Cowan, 2007.
[52] Central Asian bureau, supreme organ of Communist Party in Central Asia, created in May of 1922 and functioned until October 1934.

elimination of religion and Cultural Revolution, which later directly affected the mobile pastoralists through collectivisation and sedentarisation campaign.

In 1927, around 62% of the Kyrgyz population was practicing a nomadic or semi-nomadic lifestyle (Dzhunushaliev, 2003:125). Therefore, the total sedentarisation campaign coincided with or combined with the collectivisation policy. At the beginning of 1931 the lands for settling of pastoralists were identified. For these areas, works for irrigation and road construction were carried out (Dzhunushaliev, 2003:167-168). On 3rd of April 1931 the Government of Kyrgyz Autonomous Soviet Socialist Republic created the Republican Committee of Sedentarisation (in Kazakhstan one year earlier) and began the implementation of the settlement policy. Executive obligations were given to *Narkomzem*[53] (Rus. *Narodnyi komissariat zemledeliya* – Peoples' Commissariat of Agriculture) and All-Union Union of Agricultural Collectives of the USSR known as *Kolkhoztsentr* (functioned during 1928-1932). According to Malabaev (1982:145) in 1927 there were 132 kolkhozes (2,873 households) but by 1929 there were already 781 kolkhozes with 30,000 households. Major territories to be settled were Atbashy, Alai-Gülchö, Karakol, Kochkor, Zheti-Ögüz, Sülüktü, Ketmen-Töbö, Özgön, Kirov, Talas, Kyzyl-Zhar, Naryn, Balykchy, Nookat and Kyzyl-Kyia rayons (Fig. 3.2). By 1931 eight thousand nomadic and semi-nomadic households were settled and by 1932 only thirty thousand had been settled from the 70 thousand planned to be settled households (Abdrakhmanov, 1991:298-299).

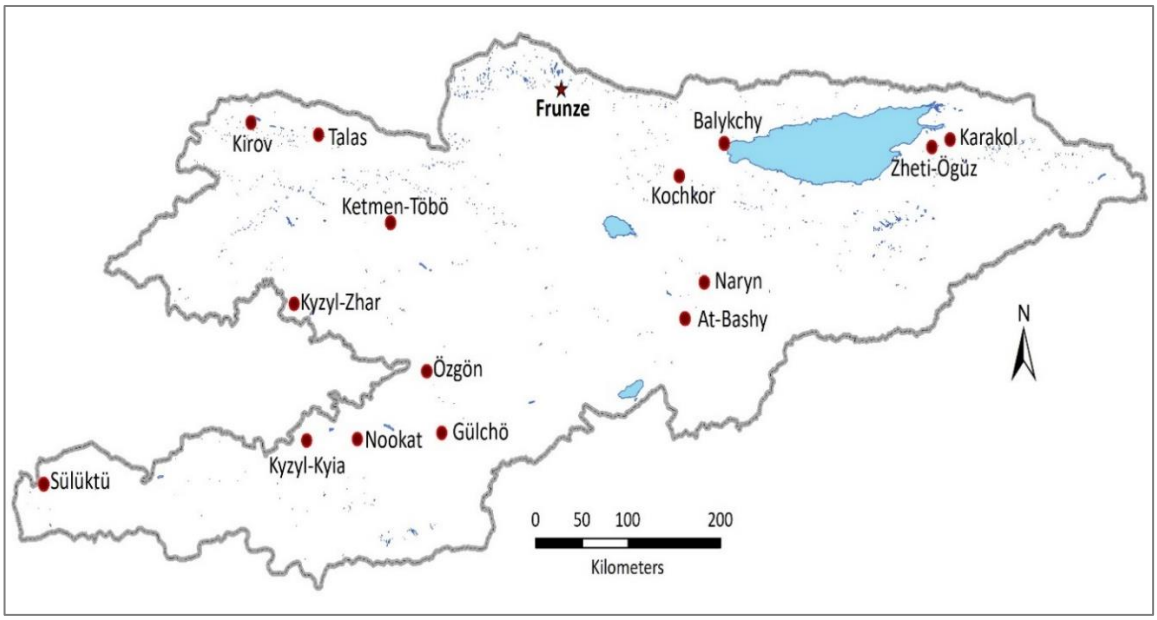

Figure 3.2 Major territories for sedentarisation by 1929
Source: Based on Malabaev, 1982:145. *Cartography:* M. Anarbaev

[53] State body with rank of ministry, responsible for planning and management of agricultural production of USSR.

For this purpose, 20 million roubles were allocated, half of which was raised from the people. Agricultural inventory, seeds, and loans for construction materials were provided to them. In addition, they were released for two years from taxes and mandatory payments. Works associated with the settling process included road construction, housing, shelters for livestock, an irrigation network, facilities for health and education services and land-planning (Malabaev, 1982:145).

In some places, governmental support was limited to just the land for settling without house construction and any social and cultural infrastructure. The chairman of government J. Abdrakhmanov called it 'paper sedentarisation'. In 1931, in the Kalininsky rayon, 160 households were settled, and houses, grain storages and other facilities were constructed without government subsidies (Abdrakhmanov, 1991:300-301).

Civil war caused substantial damage to the economy of the country. Livestock decreased by half, and crop production had fallen significantly (Toktomushev, 1982:141). Accordingly, the sheep and goat herd declined from 3.1 million in 1914 to 1.8 million in 1925, and horse numbers fell from 0.6 million to 0.3 million accordingly (Dzhunushev, 1960:61). During collectivisation, to avoid confiscation, people began to slaughter or sell their livestock (Steimann, 2011:56). This tendency is well displayed in the campaigning poster of that period (Fig. 3.3). Dzhunushaliev (2003:163) indicates that the total number of livestock decreased from 3.8 million in 1931 to 2.3 million head in 1932.

In addition, wild predators have contributed to the decrease of livestock numbers. At the end of the 1920s and beginning of the 1930s, there was rapid growth in the wolf population that caused many livestock losses. Reimers and Bibikov (1985:60) explained that before the revolution, wolf numbers were controlled by hunting activities. At that time hunters were mainly individuals or small groups working for commercial hunting (Rus. *promyslovaya okhota*) and hunting was a main source of livelihood. After taking control of the post-revolutionary situation in the country and collectivisation, the government used various means of organised measures against wild predators and the population was stabilised by 1940. However, there was no decline in the wolf's habitat area. Furthermore, due to an increase of newly established settlements there was a tendency of expanding habitats in the Asian area and taiga zone of the Soviet Union.

Figure 3.3 Propaganda poster about promoting collectivisation
It says "Go to the kolkhoz. With all your inventory join kolkhoz, do not slaughter and sell your livestock", in the middle "Who is selling out and slaughtering the livestock, is harming the workers and peasants" and "Let's give a united resistance to the kulaks. Let's organize the collective cattle yard". *Creator:* Terpsikhorov N. B. *Publisher:* Khudozhestvennoe Izdatelskoe O-vo AKhR, Glavlit, Mospoligraf, Moscow. 1930
Source: https://repository.duke.edu/dc/russianposters/rpcps03030, accessed on 08.06.2020

A similar scenario of rapid decline of livestock had also taken place in socialist Mongolia during its first attempt of collectivisation between 1925 and 1932 (Browman, 1983:246). Along with drought, crop failures and protracted civil war, according to Bibikov (1985), the 'wolf issue' played a key role. However, other sources reported (Pavlov, 1990; Vyrypaev and Vorobyov, 1983) that in addition to the 'slaughtering' factor a *zhut* occurred in that same period. The zhut is the most terrible word in lexicon of pastoralists of Central Asia. The term means the mass livestock losses due to a heavy winter, or other climate cataclysm, which causes a lack of forage.

In 1928-1929 there were 84,219 households organised in cooperatives (only 47% from total amount of households) in the republic and by 1931 up to 70% were formed in cooperatives (Dzhunushaliev, 2003:147). The first collective farms in Osh oblast were established in 1918, where the total collectivisation started in 1929 and finished by 1932. By 1940 there were already 528 collective farms. Despite of the zhut in 1927-1928, when pastoralists lost more than half million livestock (Dzhunushaliev, 2003:147; Kyrgyz Statistic Department, 1928), animal

husbandry was in a better condition than compared to 1916 when Kyrgyzstan accepted 130 thousand starving families from Kazakhstan and Siberia (Dzhunushaliev, 2003:163).

In 1927 during the 15th Congress of the All-Union Communist Party of Bolsheviks[54] the decision on collectivisation was adopted and enforced in 1929. On 5 January 1930, the Government issued the directive "On the pace of collectivisation and measures for governmental support in establishment of collective farms", upon which total collectivisation commenced (Toktomushev, 1982:142-143). Taking into account the specific conditions (e.g. *basmachy*) in some parts of the republic, it was planned by 1933 to achieve 'complete collectivisation'. To support collectivisation campaigns from the 'center', around 25,000 activist so-called, communist organisers were sent to various parts of the Soviet Union. Of them, 219 persons arrived in Kyrgyzstan in 1930 (Baktygulov and Mombekova, 2001:252). On 9 March 1930 the Government adopted the instruction "On liquidation procedure of *bai* and *kulak* households in the territories of total collectivisation". Confiscation of property and livestock was done by special commissions. It was again accompanied with *basmachy* movements. *Kulaks* or even *serednyaks* who were against the state policy of collectivisation were subject to arrest, imprisonment, or deportation (Fig. 3.4).

Figure 3.4 Deportation of dekulakised Kyrgyz people at Frunze station in 1932
Photograph: Ella Maillart, Prisonniers basmatchis, menottes aux poignets, gardés par des soldats, Frounzé
Source: Reproduced by permission of Musée de l'Elysée, www.elysee.ch

Mainly they were sent to the Ukraine, North Caucasus and Siberia, while the *dekulakised* households from those places were relocated in Central Asia (Schmidt, 2013:181). From

[54] The official name of the Communist Party of the Soviet Union during 1925-1952.

Kyrgyzstan, in the period 1927-1933, around of 1,400 households were deported (Dzhunushaliev, 2003:158-160).

The second phase of land-water reforms took place during 1927-1928 in the South of Kyrgyzstan (Fig. 3.5). It was belated mainly due to *basmachestvo*. All lands of households who owned more than 32 hectares of irrigated land or 75 hectares of rainfed land, plus agricultural tools, were subject to confiscation and redistribution among landless and poor peasants. Despite resistance of former land users, it was possible to implement land reform within 1.25 million hectares and it covered 67,220 households (Dzhunushev, 1966:91). In spring of 1927 the first mobile Pasture Council (Rus. *Kochevoi sovet*, Kyr. *Zhailoo sovet*) was organised in the highland pastures of Suusamyr Valley and in 1928 in Alai region. Later Pasture Councils were established in many places throughout the country. They were disseminating information about the state policy, regulating pasture use between pastoral groups, and facilitating organisation into cooperatives (Baktygulov and Mombekova, 2001:237). These reforms played a significant role in the establishment of permanent settlements and collective farms (Dzhunushaliev, 2003:124).

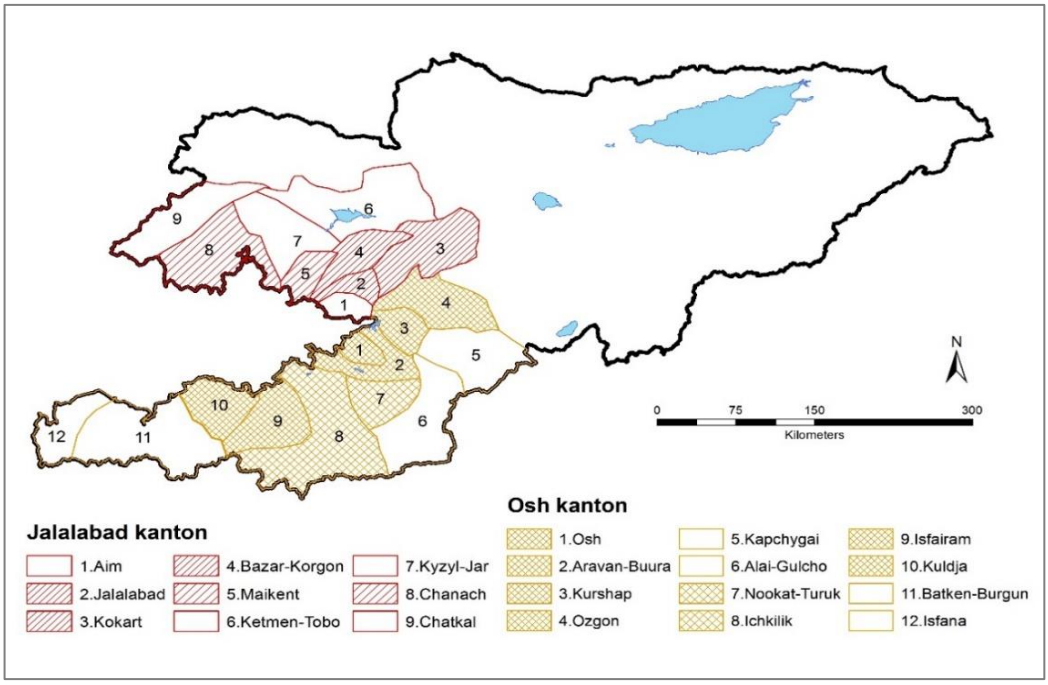

Figure 3.5 The territories where land-water reform took place during the second phase in Kyrgyzstan (1927-1928)
Source: Based on Dzhunushev, 1966:90. *Cartography:* M. Anarbaev

This process was accompanied with the campaign of sedentarisation of nomadic and semi nomadic pastoralists. In general, during the period 1918-1937, about 142,000 nomadic and semi-nomadic households, or almost 600,000 people were settled in villages (Dzhunushaliev, 2003:131). The collectivisation period is well reflected in the historical novel of Nasirdin Baitemirov “Monument of the history” (1966) about Urkuya Salieva (1907-1934) the first woman-

chairman of kolkhoz “Kyzyl-Asker” in Southern Kyrgyzstan. The novel describes struggles between party activist organisers, former feudals, and rich pastoralists who were identified as kulak. Their livestock and other agricultural assets were confiscated in favour of the collective farm. Most of them who in the point of view of the local party activists, were considered as interfering with the task of collective farming were forced to spend many years in other parts of the vast country. Indeed, several reports about excesses of dekulakisation policy were well documented and it was known to the central government officials (Abdrakhmanov, 1991:55-59). For example, there is the known case when one member of “Korumdu” kolkhoz, Toktosunov and his family in Tüp rayon of Yssyk -Köl oblast were classed as kulaks only because they were able to build a two-room wooden house, cultivate a garden with fruit-trees, and had around twenty bee colonies (Dzhunashaliev, 2003:160). Another story “Farewell Gülsary” (1966) by Chyngyz Aitmatov, gives thoughts about the ‘last nomad’ who partly lost his traditional way of pastoral life due to collectivisation. All these aspects give various feelings and raises unsolved questions for the collective memory.

The process of settling down started slowly, before the total sedentarisation campaign began. However, it was large in scale during the land-water reform period. For the rural sector of the economy, the state viewed the solution of the problem was modernisation and only possible with the transition from nomadic to settled agriculture. Sedentarisation was considered as a basis for economic development, political, cultural improvement, and modernisation of the Soviet pastoral society (Dörre, 2014:191-265). Collectivisation significantly affected the form of pastoral practices and local livelihoods (Kreutzmann, 2013b:3; Malabaev, 1982:145). This transformation also had an impact on traditional hunters – *mergenchi*[55] and hunting activities in general (Fig. 3.6).

Professional hunters found their niche and integrated into the collective farm structure. They were organised into hunting brigades (Rus. *okhotbrigada*) and were part of the state and collective farms (Lescureux and Linnell, 2013:7). They played an essential role in the economy of the farms. In addition to providing wild meat, fat, and pelts for the needs of the SOJUZPUSHNINA they undertook wild predator control works. Hunting of large predators such as wolves was considered as doubly beneficial, being sold as peltry, and reducing livestock depredation. Other

[55] Skilled hunters were highly respected. The word "*mergen*" – hunter was used as an honorific, equal to the value of the treatment "*baatyr*" – hero. There are many legends and stories how a hunter or hunters were feeding all the village during difficult times, especially in case of zhut.

species such as snow leopard, brown bear and lynx were legally harvested in Kyrgyzstan until the 1960s, by which time their populations were in rapid decline (Anarbaev et al. 2019:15).

Figure 3.6 Hunter S. Zhunushaliev from "Tuura-Suu" kolkhoz of Yssyk-Köl oblast with a trophy in 1945
Source: http://www.foto.kg/galereya/1297-nacionalnye-tradicii-ohota.html, accessed on 10.05.2018

Historically, the trading of pelts was economically profitable in Russia and then important in the Soviet Union by providing foreign currency – "valuta". For instance, in 1941-1945 the SOJUZPUSHNINA supplied to the Soviet Union treasury was over 26% of the foreign exchange earnings. In 1944, only squirrel pelts were sold, to the amount of 8.3 million pieces (Volynets, 2019).

In Siberia, the Russian Far East and other parts of USSR, where hunting was a primary source of livelihood along with livestock husbandry (e.g. reindeer), the hunting brigades were the first primary forms of collective farms. In 1924, the hunter Tikhon Novgorodov from Kolyma organised a hunting brigade. Based on this brigade, in 1930 the first kolkhoz "Turvaurgen – New Life" in entire Kolyma and Chukotka was established. Trade from hunting was successful and by 1933, the kolkhoz was supporting other economically distressed regions (Afanasev, 2006:74).

In the frame of hunting brigades every hunter had a plan for wildlife harvest. For instance, in the Alai there were 500 marmots' skins per hunter, depending on the state's order. In the past it was primarily subsistence hunting, but in the frame of collective farms it became an economic activity and well-organised. Hunting brigades were provided with rifles and ammunition (M. Zhusupov, personal communication, 2015).

After collectivisation, the tending of flock was by professional herders within the collective farms (Lim, 2012; Steimann, 2011). They were generally known as *chaban* (herdsman) but this differed according to the kind of domestic animals they looked after. For yak herdsman – *topozchu*, cattle – *malchy*, sheep and goat *koichuman*, and horse – *zhylkychy*, are the names that were used to specify their profession and position (e.g. Rus. *starshyi chaban*, *pomoshchnik chabana* – senior herder and herder assistant accordingly).

The enforced total collectivisation of 1930-1932 led to various reactions by the locals. Some people in parts of the country fought (e.g. riot in Naryn), joining *basmachis* in the south or just migrated with their livestock. For instance, at the beginning of the 1930s, 300 households went from the Alai Valley to China. People from Tuiuk and Boogachy village of Atbashy rayon of Naryn oblast left with 30 thousand sheep and 15 thousand horses (Dzhunushaliev, 2003:164-165).

Due to the belief that the Soviets (*bolsheviks*) would confiscate their livestock, many pastoralists slaughtered or sold their flocks or moved to another unreachable mountainous areas in their estimation, like Rakhmankul Khan,[56] and others. Nevertheless, by 1940, about 96% of the farmers of the country had joined the collective and state farms (Dzunushaliev, 2003:160), and the collectivisation was accomplished.

3.1.3 Collectivisation in Alai

As mentioned above, due to *basmachy* resistance, the Soviet authority was established in the Alai Valley as the last territory in Kyrgyzstan and took control by 1932 (Abdrakhmanov, 1991:280). At the same time in 1932, Leningrad (nowadays St. Petersburg) city took "political, economic and cultural patronage" (Rus. *shefstvo*[57]) over the Kyrgyz Autonomous Socialist Soviet Republic. Previously established on 14 October 1924 as the Kara-Kyrgyz Autonomous Oblast within the Russian Soviet Federative Socialist Republic, on 1 February 1926, it was reorganised as the Autonomous Republic. It became the Kyrgyz Soviet Socialist Republic on 5 December 1936, as one of the constituent republics of the Soviet Union (Baktygulov and Mombekova, 2001:236-

[56] Rakhmankul Khan (1913-1990) was a son of the district governor Zhaparkul *Mingbashy* and born in Pamirsky Post (present Murgab, GBAO of Tajikistan). Later, in early 1940s, he became a leader – khan of the Kyrgyz community settled in the Little and Great Pamirs (Kreutzmann, 2015:335-336). Afghan government named Rakhmankul Khan *pasbaan-e Pamir* – 'protector of the Pamir' (Callahan, 2012:74).

[57] Patronage or *shefstvo* was a widely popular way of support in the USSR (later in People's Republic of China also, see Shanatibieke, 2015). This form of public and social activity meant regular support (technical, cultural, material and other means of support such with cadres) of one institution to another. A widespread type of patronage was by leading organisations to collective farms, schools, orphanage, etc. In 1932, Leningradsky Sovet (Council) adopted the Decree on Assistance to Kyrgyz ASSR in Economic-Cultural Development. Later in post-socialist time many people will remember with nostalgia that they were under 'Moscow supply' (Rus: *Moskovskoe obespechenie*, e.g. Murgab rayon) or 'Leningrad supply' with a comparably better provisioning with consumer goods (see Kraudzun, 2012:95).

237). The *patronage* approach was considered to be an effective way to accelerate the development of backward regions and put them on the way of modernisation. Evidence of such 'facilitation' comes from the memories of the eldest man (Kyr. *aksakal*), a former senior worker of Kashka-Suu sovkhoz in the Alai Valley.

> In 1932 we were organised in TOZ. We were many small-small cooperatives. We have given seven mares, six cow and two camels. In the beginning, here in Kyzyl-Döng [red hill] village [present Kara-Kabak village] it was *Zelenstan* [Rus. *Zelenaya stantsiya* – Green station]. Here were only four houses that time. A Russian man with family name Shalgin stayed among us. He was cultivating vegetables and crops, experimenting various plants here in the mountains …
>
> Karybek Temirov (born in 1937), Kara-Kabak village, 2015

Later, in the 1940s, this village became known as the YUKOS (abbreviation from Rus. *Yuzhno-Kirgizskaya Opytnaya Stantsiya* – the South-Kyrgyzian Experimental Station) where various livestock breeding and crop production experiments took place (see also Watanabe et al. 2013:114). Nowadays locals have adapted this name to the Kyrgyz style and pronounce it as Ükös. The YUKOS played a key role in developing and introducing a new wool-meat specified - Alai breed of sheep. A similar kind of station was established in the Eastern Pamir of Tajikistan. There in 1936, after several expeditions, at the place called Chechekty[58] (3,860 m) the Pamir Biostation (Rus. *Pamirskaya biostantsiya*) was established (Fig. 3.7). These experimental stations were cultivating crops in small plots and testing several seed samples under various conditions to study their role in the improvement of pastures, hayfields and especially crop production possibilities. The land reform of that time including the settling down of the population, construction of irrigation systems, and the mechanisation of crop production, transformed pastoralism into agro-pastoralism in the Alai Valley. Some settlements were only engaged in crop production as their specific farming related task during the socialist period (e.g. the Kabyk village, in the Alai Valley). There was a strong theory that only a settled form of economy would give maximum output and nomadism was considered as a backward way of life (Kreutzmann, 2004:29; as well 2012:323-336). Historically, nomadic societies needed a constant interchange of products with the sedentary population (Vasilev, 1998:129). Mobile pastoralism was perceived as a 'primitive' form of economic activity and that it should be modified based on scientific and technical achievements (Rus. *Nauchno-tekhnichesky progress*) (Dörre, 2016:102).

[58] Kyr. *Chechek* – little flowers. Accordingly, Chechekty village – literally means place with plenty of little flowers.

Figure 3.7 The Pamir Biostation in Chechekty, Murgab rayon of GBAO, Tajikistan
Photograph: M. Anarbaev, 2013

It should be noted that there were three points of view, how and on which basis settling down should be executed. Among organiser-communists there were opinions that a 'kinship group' or 'clan-based' (Rus. *na osnove rodovykh otnosheniy*) approach would be a good platform for the quick implementation of the settling campaign. The other approach was based on economic abilities and interests of pastoralists (Dzhunushaliev, 2003:144). The clan-based approach was dominant in the establishment of settlements[59] (see also Steimann, 2011:103) and there were villages formed from several kinship groups (Kyr. *uruu*) such as Achyk-Suu village in the case study area.

We are here [Kara-Kabak] descendants of one clan. In general, Sary-Kol, Alai, Murgab we all are descendants from one father [Kyr. *bir atanyn baldary*]. Some settlements are comprising of various clan members… like Achyk-Suu
Öktöm Orozaliev (born in 1937), Kara-Kabak village, 2015

By 1938, in the territories of Kyrgyzstan where sedentarisation had taken place, 842 kolkhozes were organised into 300 settlements, 34 thousand houses were built, and in total 300 thousand households were settled down. Only special pastoral brigades were moving to the pastures with livestock, while other members of kolkhozes and sovkhozes remained in the villages (Fig. 3.8) to

[59] Later, already in independent Kyrgyzstan, this played a critical role in the elections to the Parliament in single-member districts. Because, the local electorate was agitated to support their clan member, that caused many discussions about the intensification of tribalism. Such cases also took place in the elections for the local municipalities.

undertake crop production, provide technical support, and maintenance of agricultural machinery, as well as in socio-cultural services (Malabaev, 1982:145).

Due to the civil war, and with the accompanied partisan *basmachy* resistance, the Alai region faced significant economic damage, and the pastoralists lost a substantial number of livestock. According to Baktygulov and Mombekova (2001:274) in the period of 1916-1920, the Kyrgyz population decreased by 35% and about 60% of their livestock was lost.

The Soviet authority was established late in Kyrgyzstan, which affected the general development in the Alai region in comparison to other parts of the country. The benefits in 1920-30s to poor peasants and pastoralists were doubtful (Dzhunushev, 1966).

Figure 3.8 Old wooden house in Kabyk village
Locally known as finsky dom (Finnish house) they were widely constructed during modernisation of animal husbandry in the Alai Valley
Photograph: M. Anarbaev, 2015

Collectivisation, followed by the modernisation of production, and the construction of irrigation infrastructure provided possibilities to increase the amount of crop farming. Pastoralists and hunters were integrated into the new socio-economic framework of the country. People were provided with infrastructure and road construction, and benefited from health and educational institutions (Kreutzmann, 2012:12). By 1937 over 200 large-scale industries in textiles, metalworking, coal mining and meatpacking were established. At the end of 1940 around 40% of Central Asian (except Kazakhstan) coal production came from Kyrgyzstan. And for the period of 1913 – 1940 the gross industrial output increased by almost ten times (Attokurov, 1982:144; Dzhunushaliev, 2003:174-181).

This period of development was characterised by radical changes and catching up in development of backward periphery regions. Despite state efforts of modernisation, in all of its complexity, the country was still agrarian with the dominant rural population. Therefore, the main objective was to use the achievements of industrial and technical progress in agriculture. The collectivisation and sedentarisation campaign combined with the application of various contemporary methods of farming. Many research institutions applied their potential and experiments in remote mountainous areas, trying to increase the productivity and crop alternatives.

3.1.4 Animal husbandry under the socialist economy

The economic importance of animal husbandry grew especially in the 1960-1970s as a result of improved new sheep breeds. The government focused on the quality of livestock and subsidised the animal husbandry sector. Experiments on the development of new breeds, which were suitable to the sharply continental climate and forage in mountain conditions, such as a tolerance to year-round pasture feeding, began since 1929. For this purpose, in the different parts of the country, several state organisations for pedigree animal husbandry (Rus. *Gosplemzavod*) were established (Lushchikhin, 1982:214). They introduced new breeds of cattle such the Ala-Tau (recognised in 1950) and Aulie-Ata breed (1974). The Novokyrgyzskaya breed of horse (1954) was created by crossing the local Kyrgyz horse with the Russian Don horse and thoroughbred (Barmintsev, 1972:115). Special attention was given to sheep breeds and in 1932 several breeding stations namely the Orgochor, Kochkor, Katta-Taldyk and Zhoon-Töbö (later named after M. I. Lushchikhin) were established. In addition, there were 48 special collective and state reproducer-farms supporting their experimental (Fig. 3.9) and approbations works on the pastures (Lushchikhina, 2007).

In Osh oblast for instance, it was the Katta-Taldyk state breeding station. As a result, by 1956, there was the Kyrgyz Finewool Breed (Rus. *Kyrgyzskaya tonkorunnaya*), and in 1966 the Tien-Shan Semi-Finewool Breed of sheep (Rus. *Tianshanskaya polugrubosherstnaya*). Before 1930s, the dominant sheep breed in Kyrgyzstan was the local *zhaidary koi* fat-tailed meat breed of sheep. However, Kyrgyzstan's 'wool specialisation' comprised the dominant share of sheep numbers through the Kyrgyz Finewool Breed, which by 1980, accounted for almost 92% (9 million) of all sheep in the republic. Around 7% (620 thousand) was the Tien-Shan Semi-Finewool Breed and one percent (80 thousand) was the Alai Semi-Coarse Wool Breed (Lushchikhin, 1982:214-216).

Figure 3.9 Flock of sheep of the Zhoon-Töbö plemzavod in the Talas Valley experimenting fenced grazing in 1975
Source: Photograph reproduced by permission of KyrNIIZH (Kyrgyzsky Nauchno Issledovatelsky Institut Zhivotnovodstva i Pastbisch), Bishkek

With the aim of utilising of the Pamir-Alai highland pastures and providing a suitable semi-coarse white wool for the carpet production, the Alai Valley became a territory for experiments and approbation of new sheep breeds. A new semi-coarse wool sheep breed started to form in the valley from 1934 in the valley through crossbreeding the local Kyrgyz fat-rumped sheep, précoce merino and saradzhy breeds. The body weight of the rams ranged from 95-105 kg, and 58-62 kg for ewes. Rams can provide a fleece weight of 6.6 kg and ewes 3.2 kg accordingly. The output of washed wool is 65-70% (Botbaev, 1983). During certification, the flocks raised on sovkhoz "Chong-Alai" and "Kashka-Suu" experimental station played a key role.

In 1974, the "Alai" sheep was formalised as a breed group. Later in 1981, it was approved by the Ministry of Agriculture of USSR as the "Alai" new sheep breed and included in the country's breed registry (Botbaev, 1983).

Sheep farming in Kyrgyzstan has been widely developed (Fig. 3.10) and has become a highly productive and profitable industry. In 1980, the number of sheep in the republic was in excess of 10.3 million head (Tursunov, 1980:7-8).

The number of purebred Alai sheep has increased considerably. In 1980 there were 47,910 including 277 breeding rams, 870 other rams and 34,055 ewes and yearlings. In the 1985, the total number of Alai sheep had reached 200,000 head and the state had an optimistic plan to increase its number to 500,000 by 1990s (Botbaev, 1983).

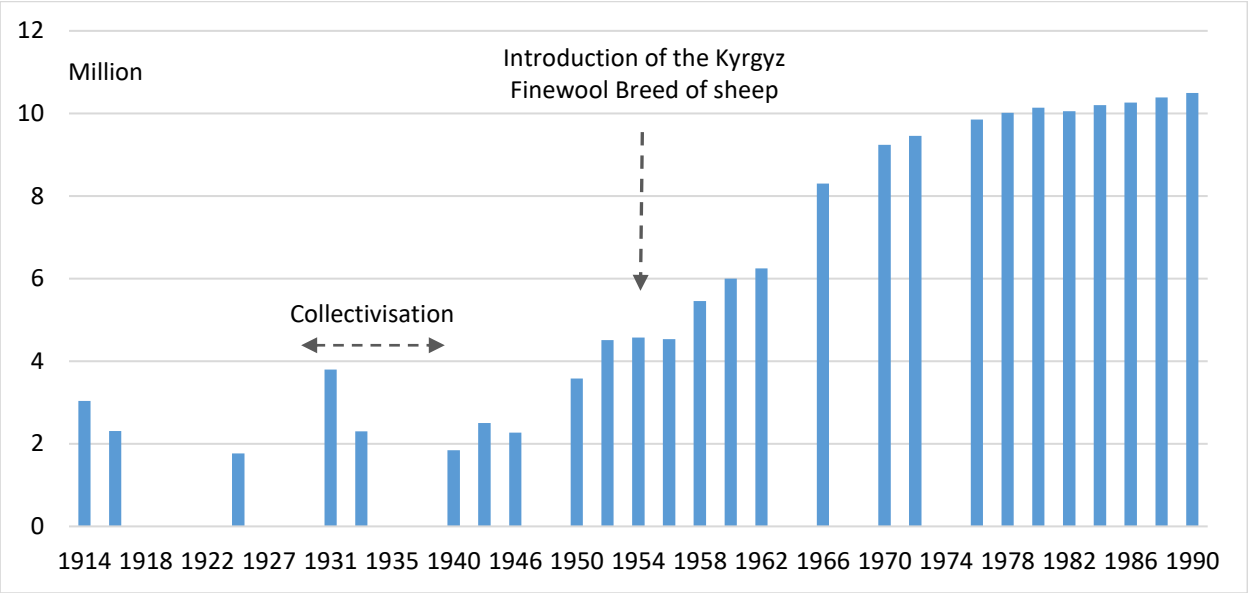

Figure 3.10 Development of sheep and goat numbers in the Kyrgyz SSR
Source: Central Department for Statistics Kyrgyz SSR, 1981:144 [1946-1980]; Central Department for Statistics USSR, 1959 [1953-1958]; Dzhunushaliev, 2003:163 [1931, 1980-1991]; Dzhunushev, 1966:61 [1914-1925]; Tursunov, 1980:7 [1916-1978]

Generally, sheep breeding was a significant income generating economy, providing 50-55% of the income source of the kolkhozes and sovkhozes in Kyrgyzstan (Vasilev and Tseliutin, 1979:10). However, privatisation, market loss in the former Soviet republics and the rapidly vanishing state subsidies made a correction to the realm of animal husbandry in post-socialist Kyrgyzstan. Low price and little interest in the local markets to the wool, contributed to the shifting of the Kyrgyz pastoralists from the merino to the traditional fat-tailed breed of sheep.

Within the Alai Valley, only few pastoralists still keep some of them (Fig. 3.11), however, their numbers and quality are decreasing year by year.

Despite of good body weight and wool characteristics, the Alai breed of sheep is becoming rare in the Alai Valley. Besides an assured market, local pastoralists argue that the breed needs more accurate tending and proper infrastructure to persist.

The Alai breed of sheep is very good in terms of meat, fat and wool. But it is very sensitive to the cold during lambing which takes place in February. If you do not have proper livestock shelter, you will lose many offspring.

Mamatyakut Zhusupov (born in 1960), Zhar-Bashy village, 2015

Nowadays, wool is not sold in large stocks, due to the small-scale of the holdings, heterogeneity of breeds, and low price offered by the middleman, thus making this business a secondary or insignificant income source. The wool is used by local individuals to make felt for yurts or ropes

for instance. Nevertheless, pastoralism remains as crucial activity and income source in rural Kyrgyzstan.

Figure 3.11 Pastoralist Mamatyakut Zhusupov of the Zhar-Bashy village in the Chong-Alai rayon, holding one of the remained exemplars of the Alai breed of sheep
Photograph: M. Anarbaev, 2015

During the socialist era a variety of political and agro-social reforms transformed the livestock sector in terms of organisation, division of labour and breeding stock. By the end of the Soviet period the newly independent Kyrgyzstan was exposed to a number of challenges regarding privatisation of production, entitlements and pasture rights, agricultural extension and management of herds. This was achieved in different steps, through legislation and institutional reforms. In addition, new challenges arose by conforming to international conventions regarding nature protection and wildlife management. The Government of Kyrgyzstan had to come to terms with international demands and local requirements. The deregulated decision-making would play an enhanced role after independence.

3.2 Institutional and legal framework for pasture use and nature protection

In the past, pastures and nature conservation were exposed to the Soviet system and its approaches. Administratively these spheres of the economy were under the Ministry of Agriculture[60] of the Kyrgyz SSR. Since independence in 1991, the Kyrgyz Government in following

[60] It was also common practice in many socialist countries as well in Eastern Europe. For instance, even nowadays by the Ministry of Agriculture of Hungary for managing its nature conservation

the *perestroika* and *glasnost* policy has undertaken many significant legislative initiatives (Eschment and Grotz, 2001) that have affected agriculture in general.

The difficult socioeconomic situation that the country faced after the dissolution of the Soviet Union forced it to implement a number of radical reforms. During the period 1991-1998, the Kyrgyz Government implemented a wide-ranging privatisation program of State-owned properties, known as 'shock therapy' (Dörre, 2012, 2014, 2015; Steimann, 2011:58) that occurred in three phases[61]. A dominant proportion of State-owned plants, factories, buildings, and other domestic service-providing enterprises were privatised.

The Government launched privatisation in the agricultural sector as well, where the agricultural land and assets of state and collective farms, including agricultural equipment, machinery, and livestock, were distributed among former farmworkers and other villagers including teachers, civil servants, doctors, and others working within the territory of the kolkhozes or sovkhozes (Anarbaev, 2018:67).

Together with the economic reforms, the country was reorganizing its system of territorial administration. With the aim of decentralisation of authority, on 19 April 1991 the Law "About Self-governance in the Republic of Kyrgyzstan" was adopted. Based on this law local municipalities were formed in the cities. But the most difficult was the situation with the organisation of local municipalities in the rural areas of the country. The village committees created in 1994 were exclusively working on the distribution of land shares to people. By this time most of the kolkhozes and sovkhozes, which had maintained the social infrastructure of the villages previously, were then dissolved. As a result of such anarchy and absence of an owner, the rural schools, hospitals, clubs, libraries, irrigation channels and other objects of social infrastructure fell into disrepair or their inventory was stolen (Dörre, 2012, 2014; Karashev et al. 2004:20).

A nationwide referendum was held on 10 February 1996 for the amendment of the Constitution of the Kyrgyz Republic to strengthen the power of the local municipality. The new Constitution supported by 98.6% of the population provided the local governments the right to own, use and manage communal property (Eschment and Grotz, 2001:10). As a result, the total 470 sovkhozes and kolkhozes established in the Soviet times were finally dissolved by 1996 (Anarbaev, 2018:68) and their former territories were organised into 455 rural municipalities (Karashev et al. 2004:21). Nowadays there are 453 rural municipalities (Fig. 3.12). Most of these were established

[61] For details of privatisation programs see the Decisions of the Government of the Kyrgyz Republic from 14 March 1994 No 120 and 20 March 1997 No 157 available at http://cbd.minjust.gov.kg

within the former collective and state farms, some of them by merging or according to geographic location by splitting.

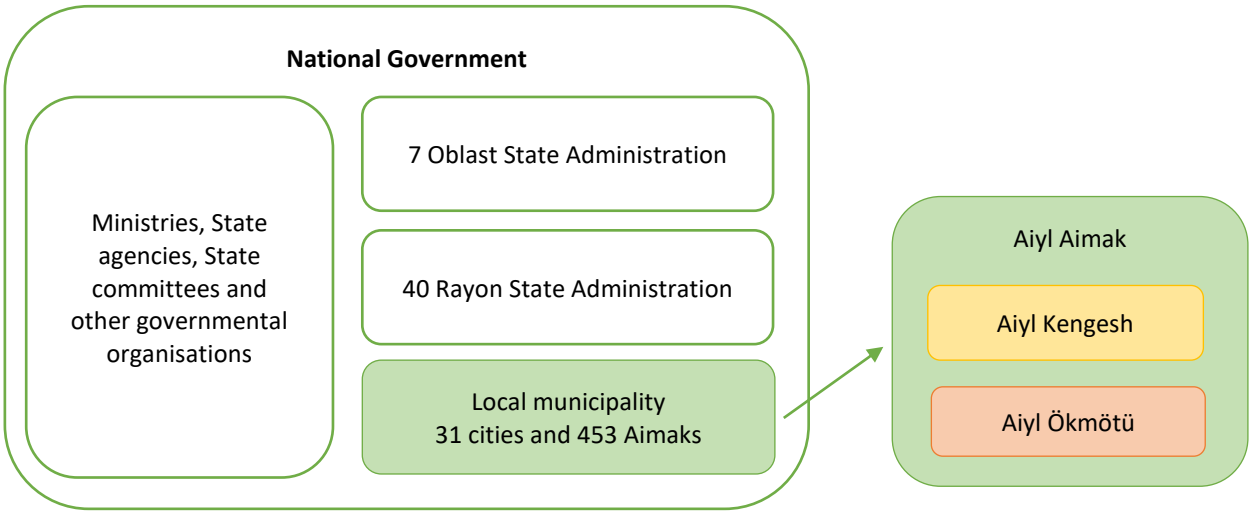

Figure 3.12 Levels of Administration in Kyrgyzstan by 2019
Design: M. Anarbaev

The Aiyl Aimak is the rural sub-district unit, within the territory of a rayon and it generally consists of several villages[62]. The rural local municipality is governed by an executive body *Aiyl Ökmötü* (verbatim Village Government) under the regulation and control of a local representative body, the *Aiyl Kengesh*[63] (Village Council).

Under the land reform plots of arable land were allocated to residents of rural areas, with various land use rights, and under a leasehold period of 49 years. Later in 1995, the Decree of the President (November 3, No. UP 297) "On measures for further development and state support of land and agrarian reform in the Kyrgyz Republic" extended the land use rights to 99 years. In 1996, the Government proposed to the Zhogorku Kengesh (the Parliament) about the expediency of the introduction in Kyrgyzstan of private land ownership along with the state ownership and this resulted in the announcement of a nationwide referendum for the amendment of the Constitution. This happened on 17 October 1998, where 95.4% of the population voted in favour of the proposed changes that guaranteed the introduction of private ownership. It was crucial and resulted in the adoption of the Land Code in 1999, which abolished the State monopoly on land and introduced private ownership rights to agricultural lands, except the pastures which

[62] But some *aimaks* consist from the single settlement. There are 48 such aiyl aimaks with a total population of 335,620 or 10.6% of the population in Kyrgyzstan. See http://www.gamsumo.gov.kg/ru/press-center/news/27
[63] Aiyl Kengesh - elected collegiate body of local self-government elected directly by the population for 4 years of the relevant administrative-territorial unit with the authority to resolve issues of local importance.

remained in state ownership (Anarbaev, 2018:68). New legislation facilitated and accelerated the property rights relations and registration. As a result, by the end of 1999, the Kyrgyz government had issued around 511,000 land certificates (Fitzherbert, 2000).

In other words, as a result of the dissolution of 275 sovkhozes and 195 kolkhozes, around 530,000 families or over 2.6 million citizens of Kyrgyzstan became owners of 75% of the arable agricultural lands. The remaining 25% of arable land has been reserved under the "National Land Fund," which is nowadays named as the "Fund for Redistribution of Land". These lands have been administratively transferred to the *aiyl aimaks*. The revenue from them remains within the budget of the local municipalities where it is used for their needs. The pastures that represent the dominant portion (86%) of agricultural land remained in state ownership (Anarbaev, 2018:68).

Before the agricultural reforms in 1991-1999, the rangelands were managed and used by kolkhozes and sovkhozes. Besides the allocated administrative territories of the arable lands, they were granted summer pastures in another rayon, oblast or even in the territory of another republic which ensured a mobile pastoralism and use of remote pastures. The use of rangeland areas was in an organised manner without payments for pasture use. In fact, the adoption of the Land Code (1999) was the first attempt to regulate pasture management. Under this legislation pastures were categorised as *village-adjacent*, *intensive* and *remote* pastures. These pasture types were under the authority of Aiyl Ökmötü, Rayon and Oblast State Administrations respectively (Lim, 2012:51). Pastures resources within the Forestry (Kyr. *Tokoi-charba*, Rus. *Leskhoz*) and Protected Areas, such State Nature Parks, were managed by the authority of the State Agency on Environmental Protection and Forestry under the Government of the Kyrgyz Republic. This categorisation of pastures was based in accordance with the geographic location of the final users. While traditional practices divide the pasture use by seasonal use, namely summer pastures (3.9 million ha), winter pastures (2.4 million ha) and spring-autumn pastures (2.8 million ha), they all remain in common use (Penkina, 2004).

Adoption of further regulations[64] introduced in 2002 and 2004, concerning the lease of pastures provided details for the allocation and management of the three categories of pastures. For instance, local rural municipalities could lease out the village-adjacent pastures or manage them as communal property. The term of a pasture lease is secured for five years and can be extended

[64] Regulations on the Procedure for Providing Pastures for Lease and Use (Government Resolution No. 360, June 4, 2002; amended September 27, 2004 and was repealed under Government Resolution No. 386, June 19, 2009). See http://cbd.minjust.gov.kg/act/view/ru-ru/53525

by another five years (Lim, 2012:52). However, this system of pasture management has been the subject of much discussion, especially the issue of pasture degradation.

Legislative improvements

Considering the importance of pastoralism for rural livelihoods, there have been several documented reports about the effect of land degradation on pastureland (Abdurashitov, 2015:59). Moreover, given that agricultural land occupies 53% of the country's territory (10.6 million ha), where the dominant portion (87%) of the land is pastures (9.2 million ha), the economic importance of pasture is high (Minagro, 2016). Therefore, the Kyrgyz Government implemented further reforms in pasture management. In an effort to improve the condition of pastureland and to solve various conflicts and administrative issues in pasture use, the "Law on Pastures" was introduced in 2009[65] (for a detailed discussion see Dörre, 2012).

With the aim of decentralisation, the administrative functions over pastureland for all pasture categories, except pastures within Forestry and Protected Areas, were transferred to a single administrator. This executive body, named the Pasture Committee (Kyr. *Zhaiyt komiteti*) was formed at a rural municipality level (Fig. 3.13).

The committee's responsibility includes the preparation of a pasture management plan and the budget for activities such as bridge construction, improvement of social and infrastructure for veterinary needs and other uses. The committee also proposes the fee for pasture use in accordance with the type of livestock. This is based on the Regulation on the measures for realisation of Pasture Law of the Kyrgyz Republic (No. 386, 19 June 2009).

[65] The Kyrgyz Parliament passed the "Law on pastures" which came into enforcement on June 26, 2009, No. 30.

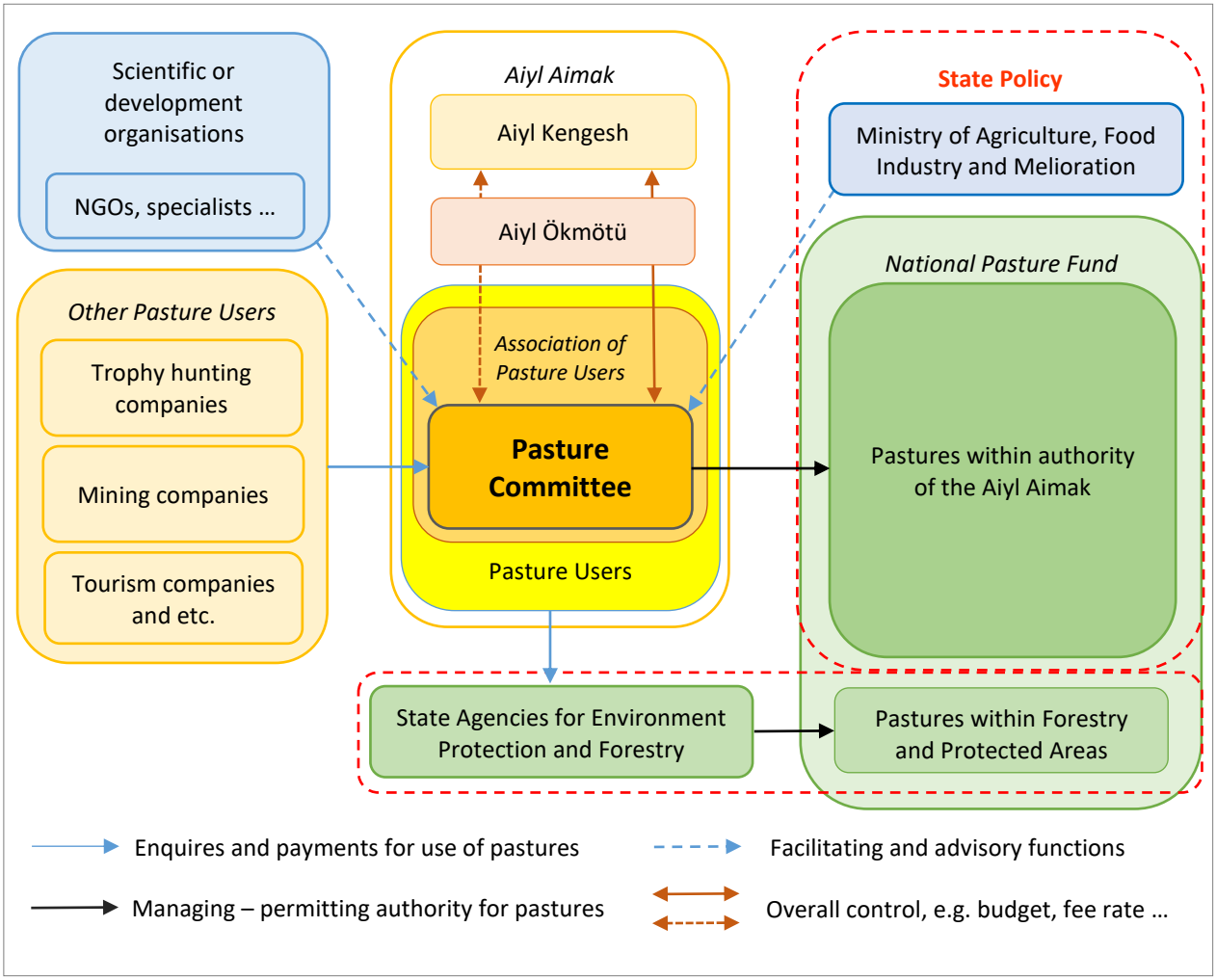

Figure 3.13 Pasture management authorities in Kyrgyzstan since 2009
Design: M. Anarbaev

A rental system of pastures was replaced by the 'conditional livestock unit' (CLU) approach. It currently uses the estimation of one adult cattle (cow and yak) is equal to one unit, young cattle (calf) to 0.7 unit, horse, donkey and camel to one unit, sheep and goat to 0.2 unit. For example, if the payment for pasture use is fixed at 60 KGS per CLU and there are 2,000 sheep, the payment will be 24,000 KGS.

A grazing permission document known as a "pasture ticket" (Fig. 3.14), is issued according to the herd size after the assessment of available forage resources for the livestock. The Pasture Committee estimates the number of livestock that can be allocated in a specified area of pasture.

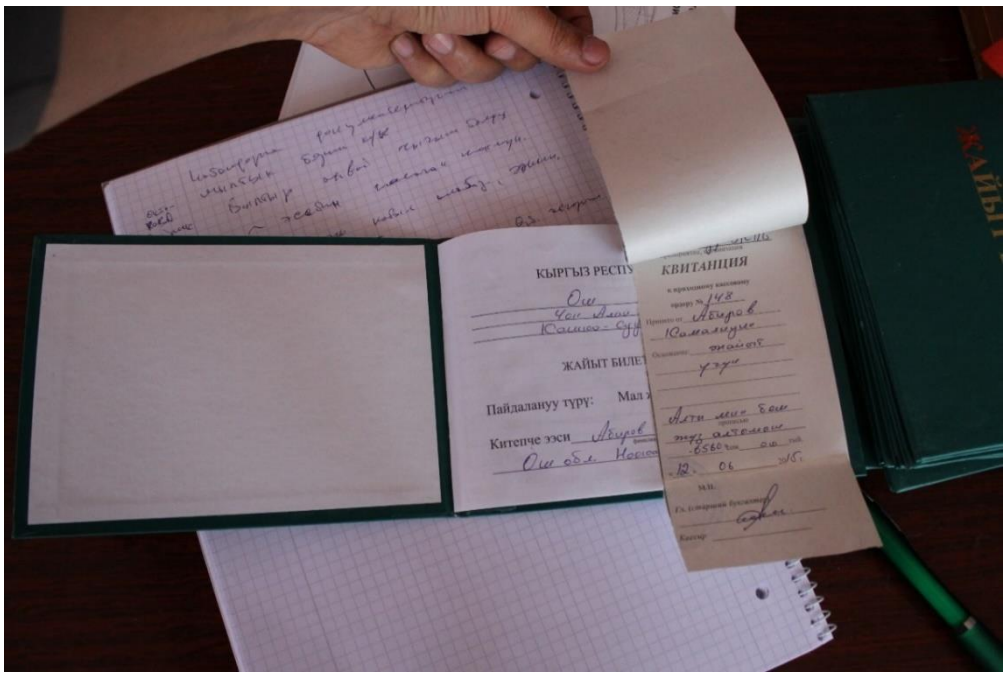

Figure 3.14 The pasture ticket (Kyr. *Zhaiyt bileti*) of the Kashka-Suu Pasture Committee of Chong-Alai rayon, which contains information about the herd size and payment for pasture use
Photograph: M. Anarbaev, 2015

Each Pasture Committee develops a management plan, which includes a grazing plan and monitoring the plan, activities which address soil and vegetation improvement including soil erosion and restoration of degraded lands, and improvement of infrastructure in pastureland. This management plan, as well as the pasture use fee rate, overall budget of the Pasture Committee is agreed by the local parliament - Aiyl Kengesh.

According to the Pasture Law, besides of direct use, the pastures can be used for tourism, hunting activities, mining and beekeeping purposes. This group of 'other pasture users' also obtains a pasture ticket and pays the Pasture Committee according to the adopted fees.

The Ministry of Agriculture, Food Industry and Melioration of the Kyrgyz Republic is the responsible state body for state policy and pasture regulation, except for the pasture resources which area allocated within the administration of the State Agency for Environment and Forestry under the Government of the Kyrgyz Republic.

Kyrgyzstan quickly adopted the global debate after its independence in 1991. Before, it was subjected to the Soviet system and nature conservation and rangeland management was under the Ministry of Agriculture of the Kyrgyz SSR. Since independence, driven by the development and popularity of ecological science, the special state body was established, which nowadays exists in the form of the State Agency for Environmental Protection and Forestry. In general, the Kyrgyz Government has undertaken many important legislative initiatives that affect the agricultural economy and environmental protection and forestry sectors.

Alongside the “Land Code of the Kyrgyz Republic” (1999), the Government adopted several other pieces of legislation, including the Law of the Kyrgyz Republic “About Preservation of the Environment” (1999), the Law “About Animal World” (1999) the “Forest Code” (1999), and the Law “About Peasant Farms” (1999). Later, the Law “About Management of Agricultural Lands” (2000), the Law “About Mountain Territories” (2002), the “Water Code” (2004), and the Law “About Cooperatives” (2004) were adopted. These laws were followed by the Governmental Regulation “About List of Threatened Species” (2005), the Law “About Specially Protected Areas” (2011) and the Law “About Hunting and Hunting Economy” (2014) with the recent amendments in 2020. This body of legislation forms the basis for human-environment interactions. The new legislation reflects the modern realities of post socialist Kyrgyzstan and have contributed to the establishment of number of state and nonstate actors. For instance, the responsibility of nature protection comes under the authority of a separate state body with the active involvement of local municipalities and a number of nongovernmental organisations. Moreover, the Law of the Kyrgyz Republic “About Preservation of the Environment” and the Law “About Hunting and Hunting Economy” have created the legal base for the establishment of community-based nature conservancies, facilitated by international organisations. The privatisation of agricultural land enables individual pastoralists to privately run their activities instead of collective and state farms.

3.2.1 The historical context of pasture use in the Alai Valley

> Before [in socialist time] we had [in the Alai Valley] many livestock. Osh oblast was good in animal husbandry. Except our livestock, we had here livestock even from Uzbekistan. They kept here up to 400,000 sheep…
> Öktöm Orozaliev, former veterinarian of Kashka-Suu sovkhoz, 2015

In the early 1980s, the Kyrgyz SSR became one of the leading countries in the world in wool production per capita. The annual gross production of wool as unwashed fibre reached 454 thousand ton, which exceeded the 1913 level by 2.4 times (Botbaev, 1983). While the Kyrgyz SSR was the *wool factory* (Undeland, 2005; Dörre, 2014) and the *meat kombinat*, the Uzbek SSR was mainly the *white gold* provider, producing 60% of the cotton requirements of the Soviet Union (Dadabaev, 2016:11) involving the bulk of the rural population. Most of the agricultural land was transformed to cotton plantations with more than half of total arable land allocated to cotton cultivation (Kharin, 2002:26). Accordingly, the collective farms of Uzbekistan started to experience a shortage in forage and grazing lands for their livestock.

According to archive documents of the KYRGYZGIPROZEM[66], the decision for the issue came from Moscow and this shortage had to be compensated by the cost of pastures in the Kyrgyz SSR. In pursuance of the directive from the Kremlin, on 19 September 1939, the Government of Kyrgyz SSR (Rus. *Sovet Narodnykh Komissarov* - Commissars of People's Council) adopted the Decree on "On ensuring kolkhozes of the Uzbek SSR with pastures in the territory of Kyrgyz SSR". For this purpose, 870 thousand hectares were allocated in 1940 for the term of 15 years. Among that, 400 thousand hectares were in the Alai Valley (KYRGYZGIPROZEM, 1988:89).

This practice was later expanded to include the entire Central Asian region. In 1946 in accordance with Directive No. 1509 of 9 July 1946 signed by Stalin "On allocation of state fund pastures for the kolkhozes of Uzbek, Kazakh, Kyrgyz and Tajik SSR and measures of their use", the Council of Ministers of USSR, requested national countries, especially the Kazakh and Kyrgyz republics, to provide almost 4.7 million hectares of seasonal pastures (Table 3.1).

In particular, 367 thousand hectares of pastureland in the Alai Valley were provided for long-term use to the Andizhan and Fergana oblasts of Uzbek SSR (Umurzakov, 1982:95). Comparatively, a smaller area of agricultural land (61.58 thousand hectares) in the terrain of Sary-Mogol was given to the Murgab rayon of Gorno-Badakhshan Autonomous Oblast of Tajik SSR for the purpose of additional forage provision for their needs (Fig. 3.15).

Table 3.1 Pasture allocation by 1946 (in thousand hectares)

For the kolkhozes *of*	Total	In the territory of			
		Kazakh SSR	Kyrgyz SSR	Tajik SSR	Uzbek SSR
Uzbek SSR	4,045	2,870	1,104	71	
Tajik SSR	293	60	209		24
Kyrgyz SSR	254	254			
Kazakh SSR	107		107		
In sum	4,699	3,184	1,420	71	24

Source: Based on KYRGYZGIPROZEM, 1988:91-92

After Stalin's political repression and Great Terror of 1937-1938, when hundreds of intelligentsia, activists and administrative elites were executed (Box 3.5), and thousands were sent to prison (Dzhunushaliev, 2003:105-106), it was difficult to go against the decisions of the "Kremlin". During the existence of totalitarian power, nobody could go against the *direktiva* of Stalin. There

[66] KYRGYZGIPROZEM (Rus. *Kyrgyzsky Gosudarstvennyi Proektnyi Institut po Zemleustoistvu*) state institute for land management, research and planning under the State Committee on Agroindustry of Kyrgyz SSR (Rus. *Gosudarstvennyi Agropromyshlennyi Komitet Kirgizskoi SSR*), nowadays Ministry of Agriculture and Melioration.

were no disputes on how external economic entities such as state and collective farms of other republics (even if a "brotherly-republic" within the Soviet Union, Rus. *bratskaya respublika*) may use one's territory without compensation.

Figure 3.15 The pasture allocation in the Alai for collective farms of neighbour republics [1939-2003]

Source: Based on archive documents of the KYRGYZGIPROZEM, 1988. *Cartography:* M. Anarbaev

In the archival documents, there is no data about payment or conditions except that they should follow determined routes - livestock driving path (Rus. *Skotoprogon*, Kyr. *Aidak zhol*) for bringing livestock to the mountain summer pastures and to adhere to epizootic regulations. This aspect of land use was explored based on archival documents and materials of the Ministry of Agriculture of Kyrgyz SSR.

Box 3.4 Political repressions

From 1925, Moscow actively started making appointments for senior administrative positions in Frunze. By 1932, more than 500 officers had arrived, with little understanding of the region and the republic. The Kyrgyz government officials expressed their discontent with this situation. In 1925, thirty Kyrgyz communists, led by A. Sydykov, A. Orozbekov and I. Aidarbekov wrote a letter to the Central Committee of the Bolshevik Party and expressed their criticism. They had hoped

in vain for a favourable outcome of the case. However, they were accused of nationalism, expelled from the party, removed from office, and then repressed. Zhusup Abdrakhmanov, who ran the Kyrgyz government during 1924-1933, also wrote several letters to Stalin, pointing out the shortcomings of the state administration. Because of this, he was dismissed and executed on 5th of November 1938. It is known that in Kyrgyz SSR, during Stalinist repressions, 137 persons were killed and their remains later discovered in the place of Chong-Tash. On August 30 of 1991, the Government held a State funeral and reburial ceremony of the remains of victims. The next day, the Kyrgyz Republic was declared as an independent state. In 2000, a Memorial Complex Ata-Beit *(Father's Grave*) was established (Chotonov and Nur uulu, 2009:169).

As depicted in the Table 3.1, the case of pasture leasing was widely applied not only to Kyrgyz SSR but also to Kazakh SSR (see Saktaganova, 2012). The most to benefit from this pasture grant went to Uzbekistan. Livestock of Uzbekistan was re-located from the densely populated Fergana Valley to other pastures. The plan was to move livestock from collective farms in the lowland to mountain pastures (Kyr*. zhailoo*) for the summer season which was not a new practice. Soviets continued to use the inherited pastoral practice that existed prior to the revolution, but it was at a different scale and centrally managed. Pastoralists in spring would move to the mountain pastures and by autumn go down to their wintering quarters (Kyr. *kyshtak*[67]) where livestock was grazed on winter pastures (Kyr. *kyshtoo*). This type of seasonal movement of flocks, was classified as vertical mobile pastoralism and is dominant in the territory of Kyrgyzstan (Kreutzmann, 2012; Scholz, 2008). Long distance horizontal movement was widely practiced in Kazakhstan and Turkmenistan, when pastoralists were changing grazing areas to follow the "green forage" (Kerven et al. 2004:160; Kharin, 2002:45). Mobile pastoralism was considered as a low-cost form of animal husbandry (Lushchikhin, 1982:214). The practice of pasture allocation to 'neighbours' for temporary use (Rus. *Ugodya dolgosrochnogo polzovaniya, UDP* – lands for long-term use) under certain conditions was one of the means to decrease the cost of animal husbandry and to increase agricultural production of cotton. Saktaganova (2012) in her paper notes that neighbouring land users were always trying to keep this method and she considers this as not only low-cost farming, but also a 'low cost' means of expanding their territories. Actually, some territories, mainly pastures officially were transferred from one republic to another. For instance, Bostandyk rayon of South-Kazakhstan oblast shifted from Uzbekistan to Kazakhstan and reversed

[67] The word *kyshtak* nowadays mostly refers to the permanent settlement in Central Asia. Originally it was associated with the wintering place within winter pastures (Kyr. *kysh* is winter).

in different periods. Probably such decisions of the center were stimulated by an organising regional economy based on “specialisation” of the republics and based on soil-climatic zones. Also the pasture allocation might be considered as an ideology-driven approach to socio-economically link the republics within the entire Soviet Union. As Steimann (2011:103) notes, “everything was linked with everything else” in the socialist era.

However, this practice had negative consequences: it significantly reduced the incentive to conduct work on the preservation of soil fertility and vegetation, which is especially important in the area of dry steppe and semi-desert, where intensive use of land such as overgrazing has led to degradation, soil erosion, desertification and affected wildlife and their habitat range.

In 1955, the Ministry of agriculture of the USSR, in accordance with provided rights, again extended the term of pasture allocation for the next 25 years (KYRGYZGIPROZEM, 1988).

Since 1958 due to worsening of the Sino-Soviet relations, the Alai Valley was a part of other border zones of the Soviet Union and access became strictly regulated. All visitors had special stamps on their passports or a permission document to be allowed to visit and stay in the Alai Valley (Fig. 3.16).

Figure 3.16 Herders from Uzbek SSR at Sary-Tash checkpoint in the Alai Valley in 1979
Border guard soldier is checking passports for permission to enter Alai Valley
Source: Reproduced by kind permission of former soldier Andrei Korshunov from his personal album

It is difficult to get exact data about how many livestock were kept and grazed in the Alai Valley during the socialist era. The socio-economic and cultural settings of the country significantly

affected the development and use of domestic animals over the socialist period. Intensification, mechanisation and state subsidies for animal husbandry, including arrangements to reduce livestock losses, lead to the rapid growth of livestock numbers. From the unpublished report of *Oshagrokompleks* (1988) it is known that sheep numbers in Osh oblast increased from 1.3 million in 1950 to 3.2 million in 1986 (Table 3.2).

Table 3.2 Sheep numbers in the Osh oblast (in thousand)

Years	1940	1950	1965	1970	1986
In all categories of farms	843.9	1,308.2	2,414.5	3,003.3	3,194.4

Source: KYRGYZGIPROZEM, 1988:2 [1940, 1950, 1986]; SU OO, 1971:52 [1965-1970]

In 1960s-70s we had already here [the Alai Valley] enough own flocks, in addition to this, our "neighbours" were coming… the herds were no longer placed (fit) within pastures. Quarrels started to happen…

Maksat Bostonov (born in 1948), former party activist (Rus. *Partorg*), Kashka-Suu village, 2015.

According to Parmanasov (1979:12), in the summer pastures, Alai Valley was hosting around 1.5 million livestock in sheep heads (e.g. one cattle is equal to five sheep). During the summer period, 250 sheep heads per 100 hectares grazed in the valley, while on average in the republic this figure was 170 sheep heads. Livestock from Andizhan and Fergana oblasts of Uzbek SSR were driven through special routes (Rus. *skotoprogon,* Kyr*. aidak zhol*) with short stays on the way (see Fig. 3.15). They were grazed for 4-5 months there, however years later a portion of the livestock stayed in winter.

In accordance to the Kyrgyz Scientific-Research Institute for Animal Husbandry (Rus. *Kyrgyzsky Nauchno-Issledovatelsky Insitut Zhyvotnovodsta*, known as KyrNIIZh), the use of fertilizers could provide an increase in forage productivity by up to 70% in the first year. Aviation was widely used in the Alai Valley (Fig. 3.17), and for this purpose an airfield was constructed in the territory of Kashka-Suu sovkhoz in parallel to the River Kyzyl-Suu.

Figure 3.17 Modified Antonov An-2 SKh[68] on fly in highland pasture in 1975
Aviation used to spray fertilisers and pesticides
No place given probably near Sary-Mogol or Suusamyr Valley
Source: Reproduced by permission of KyrNIIZH (Kyrgyzsky Nauchno Issledovatelsky Institut Zhivotnovodstva i Pastbisch), Bishkek

In conjunction with the livestock number, there was growing general competition for pastures in the Alai. Daily routine disputes with "outsider users" for grazing space became acute and obvious. To handle increased livestock numbers and to provide forage for them, in 1978 close to the leased pastures of the Fergana oblast, at an altitude of 3,100 meters, the sovkhoz "Achyk-Suu" was established. Nowadays this village is part of my case study area in Kashka-Suu aimak[69] of Chong-Alai district and counts among the high-altitude settlements of Kyrgyzstan (Fig. 3.18).
With regard to the history of the Achyk-Suu village, and how it was organised in such a place, an interesting insight has come from a former teacher of the village.

[68] The Antonov An-2 is a mass-produced single-engine biplane. The index SKh (Rus. *Selskokhozyaistvennyi* – agricultural) means that it is modified for agricultural applications. The aircraft has equipment for bulk and liquid chemicals.
[69] Aiyl aimak, the municipal territory, under rayon level. Consist from several settlements.

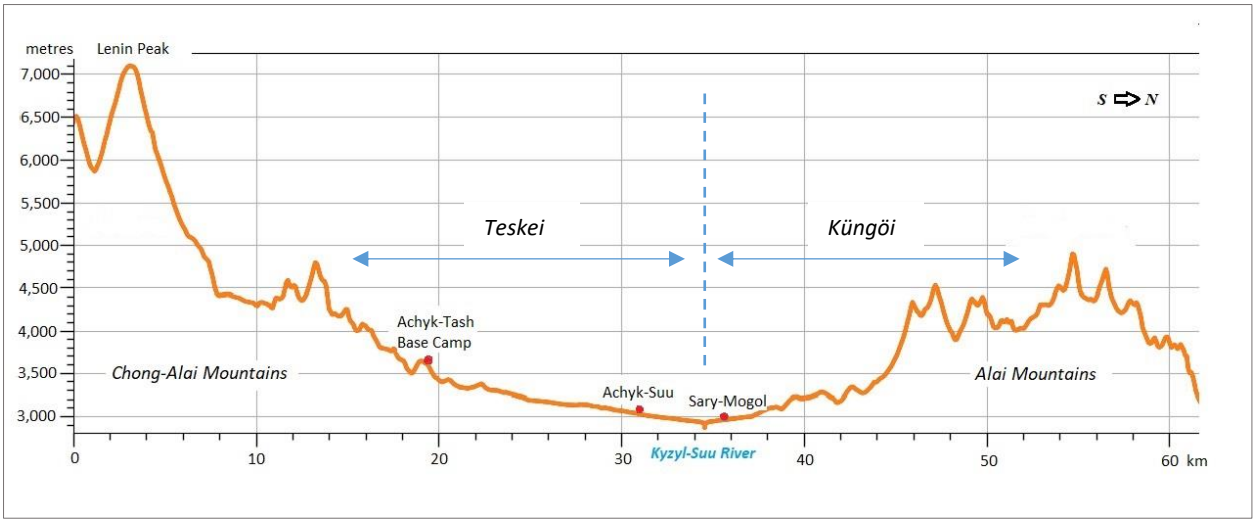

Figure 3.18 The North-South profile of the Alai Valley based on Shuttle Radar Topography Mission (SRTM) data
The pastures of the valley locally divided to the Teskei and Küngöi parts,
where the Kyzyl-Suu River is a natural border
Cartography: M. Anarbaev (QGIS 3 Profile Tool)

> Actually, the Achyk-Suu sovkhoz was established artificially and enforced in 1978. By end of the 1970s we had already a large number of livestock and experienced a pasture shortage. It was necessary to claim somehow the pastures that were used by Uzbekistan. We could not cope directly [physically], therefore it was decided to grab land in other way. The Chairman of our sovkhoz decided to establish a new sovkhoz, within few days, and several families were brought in from across the valley.
>
> Avaz Shamshoev (born in 1949), retired teacher, Achyk-Suu village, 2015

According to this story, this sovkhoz, which had a single settlement with the same name, was established forcedly, and it was a strategic and necessary step during the competition and struggle for pasture resources with the farms of Uzbekistan.

In conjunction with being a vast territory of high nutritional pastures, the Central Asian mountains are referred to as 'biodiversity hotspots' (Conservation International, 2005). Almost 10 million hectares of pastures of Kyrgyzstan are located at various altitudes and attract pastoralists because of the quality of the forage. While grazing of the lowlands dries out by the end of spring, the mountain rangelands with their higher precipitation provide an attractive option for pastoralists (Kerven et al. 2012; Mamytov, 1987). This section of the landscape is also home to wild animals, including predators. A number of studies report the competition between wild ungulates and livestock for resources (Jackson et al. 1996; Mishra, 2001; Niamir-Fuller et al. 2012). Livestock grazing is considered as significantly impacting on wildlife, which generates conservation concerns (Mishra et al. 2004:345). This also leads to 'reduced reproductive performance and density' of the wild herbivores (ibid:352).

In summertime, Alai Valley was full of livestock… here our flock… there [livestock of] others were grazing. That [socialist] time wolf was also an issue… they [wolves] had enough choices [prey] here.
Imash Myrzakanov (born in 1969) hunter of Kara-Kabak village, 2015

There are no detailed studies on aspects of livestock competition with wild herbivores in the Alai and particularly how it affects the ecological balance of wild predators (Izumiyama et al. 2009; Watanabe et al. 2010). However, the large number of grazed livestock shape and affect the population of wild ungulates in the Alai. Moreover, domestic animals are considered an excellent food reserve for wild predators, and create a suitable environment to sustain the population of predators in large numbers (Rukovsky, 1985:329). In addition, by serving as additional prey for wild predators specifically to wolves, the livestock impact causes changes in the pastureland ecosystem.

3.2.2 Rise of environmental concerns

At the end of 1960s here [in the Alai Valley] was a huge cloud of dust, because of livestock.
Now we have comparatively much small number.
Kutbidin Andarov, former Head of Kashka-Suu aimak, 2015.

A number of publications acknowledge that intensified livestock production during the socialist era caused degradation of pastures from overstocking (Dörre, 2012; Kharin, 2002; Steimann, 2011; Wilson, 1997). Soil erosion and pasture degradation issues were problematised earlier by Mamytov (1987:385). Together with a number of drivers such as climate change, deforestation, vegetation overharvesting for fuel, and exceeding the natural carrying capacity is considered as a cause of severe desertification and it affects the wildlife as well (Geist, 2005).

From the middle of the 1950s public discussion started in the Soviet Union about the importance and treatment of nature. It increased substantially during 1970-1980s when ecological issues became more obvious (Schmidt and Doerre, 2011:291). Phrases such as “natural wealth” (Rus. *prirodnye bogatstva,* Kyr*. zharatylysh bailyktary*), “careful treatment of nature” (Rus. *berezhnoe otnoshenie k prirode*) and “rational use” of natural resources were very popular in use among the academic community and mass media.

This period known as “The Thaw” (Rus. *Ottepel*) was characterised by the relative liberalisation of the regime in the inner political life of the USSR, release of political prisoners, and return of previously deported minority nationalities[70]. This time was associated with the Soviet leader,

[70] Known as *deportatsia narodov,* deportation of unreliable people from the border territories to the inlands of the Soviet Union. Especially during 1943-44 many nationalities from the Caucasus were forcefully dislocated from their homes in the republics in Central Asia.

Nikita Khrushchev who came to power after the death of Joseph Stalin in 1953 and stayed there until 1964. He was responsible for the de-Stalinisation campaign in the country after his so called 'secret speech' in a closed session of the Congress limited to Soviet delegates only. In 1956 at the Twentieth Congress of the Communist Party, he condemned the 'personality cult' of Stalin and political repressions (Shapoval, 2000:26; Taubman, 2003:270; Zubkova, 2000:83). This resulted in the weakening of the totalitarian regime, a modest amount of freedom in the arts, in the mass media, and the release of political prisoners etc. The liberalisation regime affected the animal husbandry sector as well. Already at the beginning of the 1960s there was the 'socialist environmental appraisals', including expert studies, investigations and evaluation of the environment, combined with the elements of spatial planning. It was somewhat the first prototype of Environmental Impact Assessment[71] in the Soviet Union. The so-called *expertiza*s special expert reviews, or appraisals, could occasionally address environmental impacts of selected activities (Cherp and Lee, 1997; Cherp, 2001:361). In relation to this, the environmental concerns surrounding pastures from the practice of 'shared pasture use' in the Alai were identified and problematised by the Osh branch of the KYRGYZGIPROZEM - the organisation who had a role in providing kolkhozes and sovkhozes scientific supports and services. The main idea was to increase the efficiency of their economy through rational pasture use and to carry out the monitoring of the ecological condition of the rangelands.

By 1970s the KYRGYZGIPROZEM had carried out geobotanic surveys for the entire Alai Valley. The outcome of the research work was a detailed report on pasture productivity, which estimated the carrying capacity and produced a geobotanic map. The report emphasised the degradation issues that resulted from a grazing level which was above the ecological carrying capacity of the pastures. The types of land degradation illustrated on the geobotanic map included soil erosion, changes in vegetation condition, plots overgrowing with weeds and poisonous plants, and localised loss of vegetation cover due to livestock overstocking.

According to the report of the KYRGYZGIPROZEM (1988:10-11), pasture productivity steadily declined because of unsystematic and excessive grazing. The study showed that productivity went down from 3.5 to 3.1 centner of hay per hectare by comparison to 1970. The report also highlighted an increased area of overgrazed pastures, where the vegetation cover, due to an excessive grazing pressure was reduced to 40-50%.

[71] Environmental Impact Assessment is a process of evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse. UNEP defines it as a tool used to identify the environmental, social and economic impacts of a project prior to decision-making. See www.cbd.int

In 1980 the deadline of pasture allocation to neighbours was coming to the end. The overgrazing issue due to the large number of livestock was obvious. The Agroindustrial Committee of Osh oblast (Rus. *Oshsky agropromyshlennyi komitet*, shortly OshAGROPROM) was not willing to extend the term anymore and it prepared a document with the arguments based on the geobotanic survey. In addition, the decision-making centers of Kyrgyz SSR started raising the issue of the reclamation of the leased pastures. The Agroindustrial Committee of Osh oblast prepared the justification based on ecological issues, including overgrazing, land degradation as desertification and not adhering to the requirements of carrying capacity of the pastures. However, these environmental arguments (Rus. *expertiza*) at that time were not sufficient to challenge the economic supremacy of the centralised socialist planning. As a result, establishing this "environmental argument" was not enough and did not meet the understanding of the issue by the neighbours and especially by the decision-making center. The goal of that time was to have economic growth which was emphasised by Kharin (2002:72). Thus, ecological problems became secondary or were ignored.

The Osh oblast administration was forced to prolong the agreement for the next ten years (1980-1990). During this time, the Agroindustrial Committee of Osh oblast changed the strategy of the argument. Soon it was developed from the angle of the "economical needs" of the kolkhozes and sovkhozes in terms of additional lands, or forage, to increase the economic prosperity of the oblast. In fact, the animal husbandry industry was a fast-developing sector of the economy of Kyrgyzstan. Already by 1980 the southern region, such Osh oblast, had a lack of forage (Fig. 3.19) and the pastoralists needed access to more grazing land (see Table 3.2). At that time, the number of sheep had increased by 3.8 times in comparison to 1940.

The KYRGYZGIPROZEM (1988:4) estimated that the termination of land lease in the Alai Valley by Uzbek SSR would give to Osh oblast the ability to produce an additional 1,244 tons of meat and 365 tons of wool, and by Tajik SSR, 182 tons of meat and 54 tons of wool respectively.

In addition to the Alai rangelands, the Kyrgyz government was looking at the rangelands in the Western Tien-Shan (Kyr. *Tengir-Too*, see also Schmidt, 2013:110), because, pastures in the Chatkal mountain range were also allocated to Uzbekistan. On 16 July 1984, the Government of the Kyrgyz SSR, wrote to the Government of USSR about '… not acceptability of the further degradation and necessity of conservation of important mountain ecosystems and wild species of the Chatkal Range' (KYRGYZGIPROZEM,1988:13, own translation). This request was addressed to the Council of Ministers of USSR, to discontinue the allocation of pastures and the transfer of

leased land to Besh-Aral *zapovednik*[72]. This request was even supported by the Ministry of Forestry (Rus. *Gosleskhoz SSSR*) and the Academy of Science of USSR. The Kyrgyz Government emphasised that survey of habitats of rare wild fauna and flora were undertaken, and the necessity of their urgent protection was pointed out (KYRGYZGIPROZEM, 1988).

Figure 3.19 A column of trucks with forage from Osh heading towards Alai in 1980
The banner on the front truck says "*Workers of Agroindustry! Let's accelerate the intensification of agriculture industry!*". In winters, additional livestock forage to the highland valleys was supplied from the lowland parts of the republic
Source: Reproduced by permission of KyrNIIZH (Kyrgyzsky Nauchno-Issledovatelsky Institut Zhivotnovodstva i Pastbisch), Bishkek

The phased plan of the termination of pasture allocation was developed and enforced in 1988 by the Agroindustrial Committee of Osh oblast and was divided into three phases 1988, (mainly far-distance pastures), 1989 (middle distance), and 1990 (pastures on the borderline, some of which are still under dispute until today). The Government of Kyrgyz SSR (Decree No. 167, of 31 May 1990) established a commission to address the issue of the return of "long-term use" pastures from the farms of Uzbek and Tajik SSRs. Finally, in 1990 the Alai Valley was relieved of the "outsider" livestock from Uzbekistan. However, the leased allotment land to Murgab district, at the Sary-Mogol, officially came under the jurisdiction of Kyrgyzstan much later, only in 2002 in accordance with the Decree of the Kyrgyz Government No. 695 on 9 October 2002 "About the

[72] Strictly protected nature reserve. In accordance to protected area categories of International Union for the Conservation of Nature (IUCN) *zapovednik is* belongs to category Ia.

Return to the Kyrgyz Republic the Land That Was in Temporary Use by Murghab Rayon of the Gorno-Badakhshan Autonomous Oblast of the Republic of Tajikistan"[73].

Until 1999, the issue of the Sary-Mogol was not so acute and was not raised, both by the public and the government of Kyrgyzstan. The Alai Valley connected with the Murgab rayon via Kyzyl-Art pass (4,280 m), and local people from both sides have historical kinship connections. Following the establishment of the State Border Guard Service (28.05.1999) of the independent Kyrgyzstan, the formalities of the border crossing procedure started to appear. The most significant driver was the so called "Batken Wars" which occurred in August-September 1999 and August-October 2000, covering the territories Chong-Alai and Batken rayons of Osh oblast. Then in 2001, the Kyrgyz Parliament gave the directive to the Government of socio-economic support as well as to study *who is who* in the Alai Valley[74]. At that time, post-socialist Tajikistan, powered by the political instabilities, was still struggling due to the 1992-1997 civil war (see also Kraudzun, 2016:167), and it was difficult to make official negotiations about land. Moreover, in the Sary-Mogol were living the dominantly ethnically Kyrgyz population, but juridically, citizens of Tajikistan and other land users within the valley tolerated them.

The people of Sary-Mogol were given an option to choose a citizenship of Kyrgyzstan and stay there. However, the change of citizenship resulted in many other issues such as eligibility for a pension, the necessary documents for retirement, and the legalisation of their house. In addition, most of them had properties in Murgab rayon of Tajikistan and etc.

Termination of the highly intensified system of livestock production generally had a positive effect on rangelands and granted respite for plant recovery[75] of the far distant summer pastures. However, it caused extra pressure on pastures closer to the villages (Lim, 2012:47). The study by Liu and Watanabe (2016:122) shows the recovery of the vegetation cover. In accordance with their remote sensing study, the pasture plots previously considered as degraded were already under the category of 'vegetation covered' areas. Nevertheless, not all vegetation is considered useful for pastoralism by pastoralists. Therefore, the vegetation type which is edible by livestock, and the weeds, should also be differentiated.

The external drivers of change have been introduced during the period of central planning and strict authoritarian rule as well as in the aftermath of independence.

[73] Retrieved from http://cbd.minjust.gov.kg/act/view/ru-ru/53902?cl=ru-ru accessed on 10.10.2015.
[74] Resolution (No. ZN 461-II, 21.09.2001) of the Legislative Assembly of the Zhogorku Kengesh of the Kyrgyz Republic http://cbd.minjust.gov.kg/act/view/ru-ru/52492/10?mode=tekst Accessed on 12.10.2016.
[75] Recovery of plants discussed in Weber and Horst (2011:4).

Previously livestock management was embedded in a central planning scheme in which Kyrgyzstan was allocated the function of providing forage for livestock herds irrespective of their origin. With growing pressure in pasture availability these arrangements were renegotiated leading to the exclusion of herds from neighbouring republics by end of 1980s.

After independence the need of adaptation of rules and regulations following national demands required amendments and modifications in all walks of life. Kyrgyzstan's government issued decrees and laws that had significant impact on all pasture territories and especially on the Alai Valley.

These reforms coincided with a stronger influence of international institutions in the nature and wildlife protection complex. The existing estranged relationship between pastoralists and predators experienced a new chapter as international organisations attracted their donor money and endowments to the adherence to acknowledged nature protection measures and activities. Consequently, Kyrgyzstan's governance practices in respect to nature protection, pasture use and wildlife management came under scrutiny and have become a vital agency in developing the relationship between pastoralists and predators.

4 Governance of space, border and wildlife

> Over time spatial utilisation strategies have been transformed in accordance with the shift of political players and replacement of stakeholders
> (Kreutzmann, 2013a:3)

Conservation biologists emphasise that human-wildlife contact is unavoidable in areas of habitat overlap. Usually, it has been viewed as competition between humans and wildlife for space and food resources (Inskip and Zimmermann, 2009:18). Human activities such as pastoralism and resource extraction are considered as the main threats to wildlife. Wild ungulates compete with livestock, for food, leading to their reduction, as wild prey or large predator species are retaliatory killed because of livestock depredation (Rovero et al. 2018:1; Treves et al. 2004:115). However, some species appear to adapt and even thrive in an anthropogenic environment (Sharma et al. 2015:8; Takahata et al. 2014:1). Therefore, the historical development of land use is essential to better understand the spatial utilisation of the territory (Kreutzmann, 1996:173). Particularly, in part, of how the space governance has altered the human-wildlife interrelationship.

4.1 Development of Protected Areas in Kyrgyzstan

Mountains have an important place within Key Biodiversity Areas and have the highest coverage (20%) of protected areas in the world (UNEP-WCMC and IUCN, 2016:63). The international wildlife conservation community recognizes the Tian-Shan and Pamir-Alai Mountain ecosystems as biodiversity hotspots. Since Kyrgyzstan gained its independence in 1991, many international nature conservation organisations have opened permanent offices and implemented various projects in the country. Their efforts are focused on saving threatened species assemblages, sustainable wildlife management, enhancing the protected areas network, educational programs and many other activities in connection with biodiversity conservation.

Despite economic hardship, the Kyrgyz Government has declared that wildlife conservation is a priority under state policy, and it is included within its National Development Strategy 2025. In this regard, a special role is given to the Protected Areas. Traditionally the system of Protected Areas, which has existed since the Soviet era, serves as a solid foundation for future expansion of conservation efforts in the country (Farrington, 2005:43).

According to Aichi Biodiversity Target 11 within the Convention on Biological Diversity (CBD), by 2020, the Global Protected Area Network should reach at least 17% of the world's terrestrial and

inland water areas (Fig. 4.1). Moreover, within the National Strategic Plan for Biodiversity 2011-2020, the coverage of Protected Areas is used as an indicator for the implementation of the Sustainable Development Goals of Kyrgyzstan in part of environmental security and wildlife conservation. Therefore, the Kyrgyz Government has made a plan to increase the coverage of Protected Areas to make up to 10% of the country's territory (National Council for Sustainable Development of the Kyrgyz Republic, 2018:49). The Network of Protected Areas in Kyrgyzstan has constantly expanded over the past several decades (Fig. 4.2).

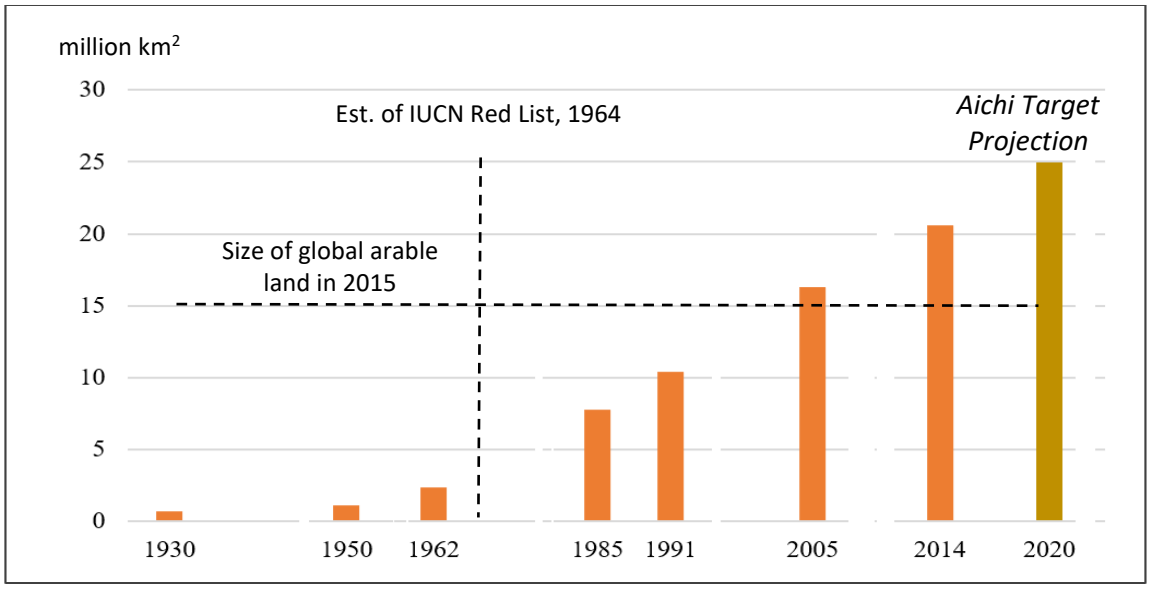

Figure 4.1 Development of Protected Areas in the World

Source: Compliation based on FAO, 2015; Juffe-Bignoli et al. 2014:8, Kollmair et al. 2005:185

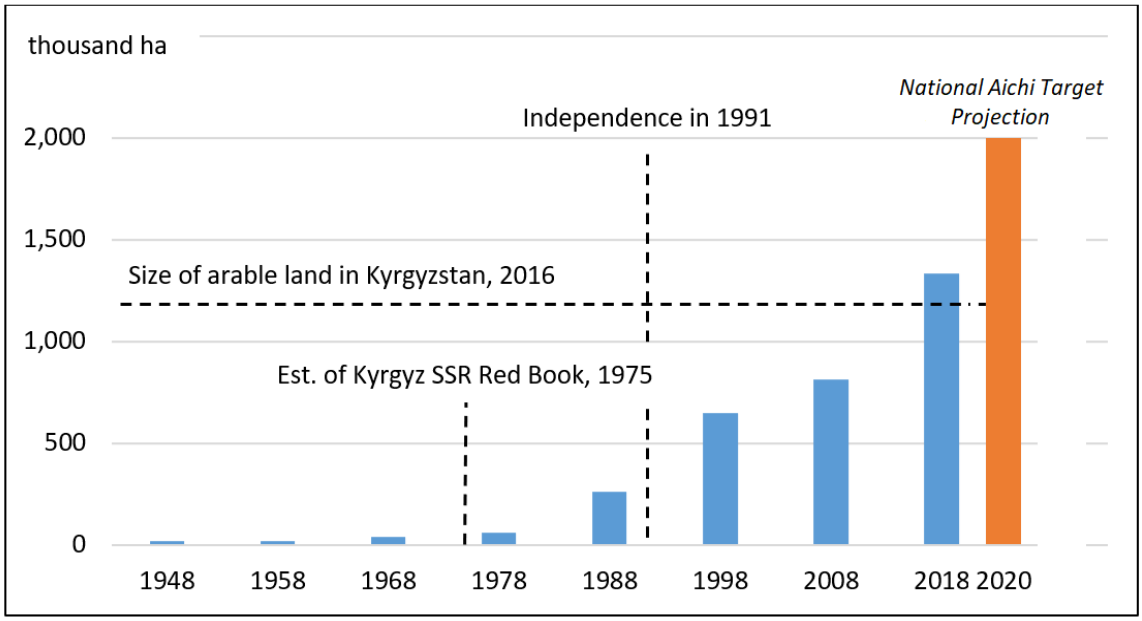

Figure 4.2 Development of State Nature Parks and Reserves in Kyrgyzstan

Source: Compliation based on Mamytov et al. 1985; Minagro, 2016; State Agency on Environmental Protection and Forestry, 2016; 2020

In 1985, Protected Areas in total occupied 533.4 thousand hectares (Mamytov et al. 1985:9) and by 2018, the Protected Areas were already 1.53 million hectares or 7.7% of the country's territory (Table 4.1). It is greater than the available 1.2 million hectares of arable land in the republic. Since independence, the territory of Nature Parks and Reserves increased by 3.7 times.

There are slight differences in the figures between various reports made on the Protected Areas of Kyrgyzstan. The reason is that the territory of some state reserves has changed over time. For instance, in 2009 the Government gave some areas of the Sarychat-Ertash State Nature Reserve to the Kumtor gold mine company.

Table 4.1 Establishment of Protected Areas in Kyrgyzstan

	State Nature Reserve	Year	Area, ha	Notes
1	Yssyk-Köl	1948	18,999	
2	Sary-Chelek	1959	23,868	Within PA, there is one village (1,300 people)
3	Besh-Aral	1979	112,463	
4	Naryn	1983	91,024	Ongoing projects by Kaiberen, OSI Panthera
5	Karatal-Japyryk	1994	36,393	Ongoing projects by NABU
6	Sarychat-Ertash	1995	149,118	Ongoing project by SLT, WWF, FFI
7	Padysha-Ata	2003	30,556	
8	Kulun-Ata	2004	27,434	
9	Surma-Tash	2009	66,194	
10	Dashman	2012	7,958	Originally was designed within 8,190 ha
			564,007	
	State Nature Park	Year	Area, ha	Notes
1	Ala-Archa	1976	16,485	Ongoing project by Panthera
2	Kyrgyz-Ata	1992	11,172	
3	Kara-Shoro	1996	14,440	
4	Besh-Tash	1996	13,732	
5	Chong-Kemin	1997	123,654	Ongoing project by Panthera
6	Karakol	1997	38,095	
7	Salkyn-Tör	2001	10,419	
8	Saimaluu-Tash	2001	31,932	75 ha withdrawn for road construction
9	Sarkent	2009	40,000	
10	Kara-Buura	2005	61,544	In 2012 downgraded to Nature Park
11	Kan-Achuu	2015	30,497	UNDP/GEF project
12	Alatai	2016	56,826	UNDP/GEF project
13	Khan-Tengiri	2016	275,800	UNDP/GEF project
			724,596	

	Sanctuaries:		Area, ha	Notes
	2 complexes		10,142	
	23 botanicals		6,115	
	12 zoological		222,325	Rus. *Okhot zakaznik*
	8 forest-zakaznik		2,816	Rus. *Lesnoi zakaznik*
	19 geological		100	
			241,498	

Source: Compilation based on unpublished data of the State Agency on Environmental Protection and Forestry, 2019

However, in 2013 due to high pressure from the "conservation community" the territory of the reserve's area was restored and even increased from 121,000 to over 149,000 hectares. This coincided with the hosting in October 2013 of the Global Snow Leopard Conservation Forum in Bishkek. Later, the North-South alternative road construction project led to a withdrawal of 75 ha in the Saimaluu-Tash Nature Park.

As a rule, conflict between Protected Areas designation and local people occurs in regard to access to pastures for livestock grazing. In 2012, in a bid to solve the conflict in Talas oblast around the Kara-Buura State Nature Reserve, the reserve was downgraded to the category of a Nature Park (Government Decree No. 822 on 11.12.2012), which allows livestock grazing inside of the park, except in the core zone. Another conflict situation occurred in Zhalal-Abad oblast with the newly established Dashman Nature Reserve in 2012. The neighbouring Kyzyl-Üngkür local municipality of Bazar-Korgon rayon, on behalf of the residents, was against this initiative. Finally, the respective sides reached a compromise and in 2013 the reserve started operating with a smaller territory than what was declared initially.

Nevertheless, following an international environmental agenda and demand for nature protection, Kyrgyzstan has been steadily increasing the Network of Protected Areas. "None place based" actors as a rule allocate funds and act through various international agencies based in Bishkek. For example, the Global Environment Facility (GEF) and the United Nations Development Programme (UNDP) together with WWF and USAID allocated over three million USD grant money to the project "Improving the coverage and effectiveness of Protected Areas in the Central Tian-Shan Mountains" with 2013-2017 being the implementing period. In addition, the Global Environment Facility allocated another four million USD funds to the period of 2017-2022 "Conservation of globally important biodiversity and associated land and forest resources of Western Tian-Shan mountain ecosystems to support sustainable livelihoods" project in Kyrgyzstan (UNDP-GEF, 2016:26).

The UNDP Bishkek Office is designated as the implementing agency in partnership with other international organisations, and the State Agency for Environment Protection and Forestry as the executive partner. The project's outcomes were the establishment of two new Kan-Achuu and Alatai Nature Parks established in 2015 and 2016 respectively. Under the parallel GEF-UNDP project in the Central Tian-Shan, in 2016 the Kyrgyz Government established another new Khan-Tengiri Nature Park which is the largest park in the republic with a territory of 275.8 thousand hectares.

In the remote areas where the resident population is low, Protected Areas can be established with almost no conflict. In contrast, Protected Area establishment creates additional job opportunities in sparsely populated regions. For instance, the village of Ak-Shyirak with 30 households, neighbours with the Sarychat-Ertash Reserve and benefits from it as more than half of the employed rangers are from this village. However, in other parts of the country, namely around the Kara-Buura Nature Park, Dashman and Naryn Nature Reserves, the local population has made claims on pastures. Considering the abovementioned issues related to organising new Protected Areas, the establishment of the new Alai Nature Park seems to be problematic. The Nature Park status permits grazing of livestock in its buffer zones. However, pastoralists are not allowed to shoot wolf for instance, inside of the Protected Areas.

4.2 Establishment of the Red Book in Kyrgyzstan

Alongside the establishment of Protected Areas, the Red Book has been used as a key tool for wildlife protection, decision making and prioritising the environmental agenda. The history of the Red Book evolution in the Kyrgyz Republic began back in 1974, when the Red Book[76] of the USSR was established. Accordingly, in 1975 the Government of Kyrgyz SSR adopted a decree approving the list of protected state fauna and flora. The first "Red Book of USSR" was published in 1978, which also included species occurring in the Kyrgyz SSR. Later the Government of Kyrgyz SSR by Decree No. 261 on 18 May 1979 officially established the Red Book of Kyrgyz SSR. In 1981 and 1984, the list of rare and endangered species of animals and plants of the Kyrgyz SSR was finalised and approved with additions. This was necessary and led to the 1984 Second edition of the Red Book of USSR. In 1985, the First edition of the Red Book of Kyrgyz SSR was published[77]. As shown

[76] Rus. *Krasnaya kniga*, Kyr. *Kyzyl kitep.*

[77] Based on the Decree of Government No. 505 of 5 October 1984 "On the further development of the network of specially protected natural areas and measures to ensure the protection and reproduction of species of animals and plants listed in the Red Book of Kyrgyz SSR" see in http://cbd.minjust.gov.kg

in the chronology (Table 4.2), over a period of twenty years the independent Kyrgyzstan was able to update and publish its Red Book only in 2006.

Table 4.2 Chronology of Red Book development in Kyrgyzstan

Years	Outcome
1974	Establishment of Red Book of USSR. Ministry of Agriculture of USSR, adopted list of rare and endangered animals and plants of USSR
1975	Government of Kyrgyz SSR adopted decree on approving the list of protected by state fauna and flora. Additionally established 61 wildlife sanctuaries
1978	The First edition of Red Book of USSR was published
1979	Government of Kyrgyz SSR by Decree No. 261 on 18 May 1979 adopted decision to prepare and publish the Red Book of the Kyrgyz SSR
1981	The list of rare and endangered species of animals and plants of the Kyrgyz SSR approved by Government (but received many requests for additions)
1984	The list of rare and endangered species of animals and plants of the Kyrgyz SSR approved with additions and amendments
1984	Publication of Second edition of Red Book of USSR
1985	Publication of First edition of Red Book of Kyrgyz SSR
2005	The list of rare and endangered species of animals and plants of the Kyrgyz Republic approved by Government Decree No. 170 on 28 April 2005
2006	Publication of the Second edition of Red Book of Kyrgyz Republic
2009	Amendments to the list of rare and endangered species of animals and plants of the Kyrgyz Republic. Added 9 and excluded 18 species. Government Decree No. 471 on 25 July 2009.

Source: Compilation based on Mamytov et al. 1985 and updated based on Regulations retrieved from http://cbd.minjust.gov.kg

Adoption of the first hunting legislation in 1930 provided for the protection of rare wild animals and birds in Kyrgyzstan. Since 1963 the list of protected animals has expanded to include snow leopard, manul and brown bear (Mamytov et al. 1985:9). The general aim of this regulation was to enhance the protection of wildlife. Since the establishment of the Red Book, the number of endangered species has increased by several times. Particularly, mammals – 1.4, birds – 1.8, fish – 7 times (Table 4.3). In the Red Book, besides poaching, mobile pastoralism is listed as a threat for most of the wildlife.

Table 4.3 Number of wild species listed in Red Book of Kyrgyzstan

Year of assessment	Mammals	Birds	Fish
1975	17	31	1
1985	13	20	1
2009	23	57	7

Source: Compilation based on Mamytov et al. (1985:9) and updated based on Government Decree No. 471 on 25 July 2009 (see http://cbd.minjust.gov.kg)

Specialists welcomed the updated edition in 2005 however there were some critiques as well. In 2009 it was necessary to exclude 18 specific species and include 9 other species to the list. Nevertheless, the presence of some species on the Red Book has generated more confusion than clarity. In particular the predator species locally known as *Kyzyl karyshkyr (Cuon alpinus)*[78] (verbatim – red wolf, in English refers as Dhole or Asiatic Wild Dog) have created confusion among local hunters and pastoralists. In the Kyrgyz language version of the Red Book (Tokmergenov, 2006:496) this species appears as *chöö*, which is the jackal *(Canis aureus)*. In accordance with the Regulation of the Government "About Hunting Rules in the Territory of the Kyrgyz Republic" (2015), the jackal (Kyr. *chöö,* Rus. *shakal)* is referred as a pest animal and can therefore hunted without limit (Table 4.4). Moreover, bounty rewards are paid by the State Agency for Environment and Forestry for hunters to harvest them.

Table 4.4 Wildlife harvest norms (except species listed in the Red Book of the Kyrgyz Republic)

#	Name of species				Harvest norms	
	English	Kyrgyz	Russian	Latin	Daily	Seasonal
1	Wolf	Karyshkyr	Volk	*Canis lupus*	no limit	
2	Jackal	Chöö	Shakal	*Canis aureus*	no limit	
3	Corsac	Kichine tülkü	Korsak	*Vulpes corsac*	2	10
4	Red fox	Tülkü	Lisa	*Vulpes vulpes*	1	10
5	Badger	Kashkulak	Barsuk	*Meles meles*	1	4
6	Tolai hare	Koyon	Zayats	*Lepus tolai*	3	20
7	Yellow ground squirrels	Sary chychkan	Zheltyi suslik	*Spermophilus fulvus*	no limit	
8	Relict ground squirrel	Kaldyk sary chychkan	Relikotvyi suslik	*Spermophilus relictus*	no limit	

Source: Compilation based on "Hunting rules in the territory of the Kyrgyz Republic" adopted by the Government Resolution No. 143 on 23 March 2015 (as amended by the Government Resolution No. 383 on 19 June 2017)

Therefore, it was not surprising that during a field survey in Alai Valley in 2015, some responders understood that wolves are protected, and that they are a "Red Book species". According to Sosnovsky, (1987:56) within the Soviet Union, the so-called red wolf was found in Kyrgyzstan based on several pelts harvested during the 1930s. Currently, no other recent reports confirm of the Dhole being present in Kyrgyzstan.

4.3 Borders and wildlife. Border zones as a free land for wildlife

Boundaries are crucial attributes of sovereignty and generally they have been studied separately from the people by highlighting their role for states to implement various functions such as legal,

[78] In Russian version of the Red Book, it written as *Krasnyi volk* – Red wolf. In the Decree of Government No. 170 from 28 April 2005 (Annex 2:14), it refers as Rus. *Krasnyi volk*, Kyr. *Too chöösü* (mountain jackal)

fiscal, control, military and ideological (Kraudzun, 2016:161). In recent years, the matter of border issues in relation to biodiversity conservation, has become a question of Political Ecology in respect to cross-boundary nature conservation (Ramutsindela and Noe, 2015:510). Hanson et al. (2009:579) in their essay "Warfare in Biodiversity Hotspots" discuss that more than 90% of armed conflicts between 1950 and 2000 occurred in biodiversity hotspot countries. The effects of war can have a negative effect on wildlife and their natural habitats. In some cases, it may also provide an ecological benefit due to a limitation on resource utilisation or reduced human access to the territory, for example, a reduction in resource-based economic activity along the border of conflicting countries, in particular animal harvesting.

A dominant view among conservation biologists is that the border security concept applied during the Cold War had a positive impact on the ecology of frontier areas. For example, insulation from economic development and hardened national border regulations resulted in wildlife and vegetation conservation in the Eastern Carpathian Mountains (Wieckowski, 2013:5). The statement of Hanson et al. (2009:584) that 'the buffer zones between opposing forces, can become reservoirs for wildlife' is applicable for many parts of the world even nowadays. Untouched for decades the demilitarised zone between North and South Korea, the Russian borderline in the west and Far East, and the former border zone between Turkey and Georgia and Armenia in the Caucasus Mountains provide modern examples. By the opinion of wildlife biologist Koshkarev (2002), the Soviet border guard system and engineering solutions along border zones were good habitats for wildlife, except for the large migratory species that need to cross the border zones. These territories have positively contributed to biodiversity, for example by 1990s, most of the argali populations in Kyrgyzstan have been preserved in the border zones (Fedosenko, 2000:159).

> After the collapse of the Soviet Union, Kyrgyzstan has inherited many bad things and good things, such as former communist officials and untouched nature along the border with China
> (Koshkarev, 2002) own translation

During the socialist period in Kyrgyzstan, the rapid changes in agricultural practices, including the development of animal husbandry, led to a decrease of some wildlife in their original habitats. This reduction in natural prey made some wildlife species, particularly the snow leopard, vulnerable to local extinction. However, as in other border territories of the Soviet Union, not all parts of Kyrgyzstan were under intensive exploitation and agricultural utilisation.

The senior biologist Koshkarev (2002) emphasises the benefit of the huge territory associated with the so-called border zone (Rus. *Pogranichnaya zona*, shortly *pogranzona*) and of the strict guarding and access regime (Fig. 4.3), which was in force between the peak of Khan-Tengri in the Tien-Shan and the Pamir-Alai during the many years of Soviet rule.

Figure 4.3 Passport control at checkpoint Sary-Tash in the Alai Valley in 1979
According to the car's number plate (ANE), it belongs to Andizhan oblast of Uzbekistan
Source: Reproduced by kind permission of former soldier Andrei Korshunov from his personal album

He estimates the area of the border zone territory is in the order of 100 thousand km^2. The access to border zones was limited and required special permission, except for local inhabitants, who usually had a special stamp on their passports.

In the past, such adjacent territories bordering with China was a part of a special regulation of the central government and affected the limited use of natural resources. The complex of engineering construction with electric alarm systems called '*signalizatsionnaya sistema*' (signal or alarm system) or known as '*sistema*' among locals (Kreutzmann, 2016b:9) was actively used along Soviet-Chinese border (Fig. 4.4). The thousands of poles with barbed wires are visible even today in Murgab rayon of GBAO, Tajikistan (see Kraudzun, 2016:164). The Control-Track Stripe (Rus. *Kontrolno Sledovaya Polosa*) to detect footprints was officially adopted for use in borders since 1947 in accordance to the directive "*INZHTOG-47*" (Rus. *Inzhenerno-Technicheskoe Oborudovanie Gosudarstvennoi Granitsy SSSR* – Engineer-Technical Facilities of State Border of USSR) and by 1955 it was used with all-important western border sites of the country (Zvezhinsky

et al. 2007:4) as well as in the Caucasus Mountains that bordered with Turkey which became a NATO[79] member in 1952.

Figure 4.4 The Control-Track Stripe in combination with signalisation was constructed with the purpose to increase the effectiveness of border guarding in vast territories
Photo from near Kara-Köl area, Murgab rayon, GBAO of Tajikistan
Photograph: H. Kreutzmann, 9 July 2007

On the land-use map of the Ministry of Agriculture these territories were marked as "Lands for Special Purpose No. 13" (Rus. *Zemli Spetsialnogo Naznacheniya* No. 13, for instance on the geobotanical map of KYRGYZGIPROZEM from 1980s).

The origin of the strict border zone regime between Kyrgyzstan and China goes back to the 1950s. So called Khrushchev's "secret speech" in 1956 at the 20th Party Congress about 'Stalinism' or 'personality cult' (Zubkova, 2000:82) raised many political issues. Leaders of the Socialist bloc interpreted the report differently. Although Chairman Mao Zedong did not react publicly, he was displeased that the Soviet leader did not consult with him about this sensitive and "important report". The critics of the address of the former Soviet leader were dissatisfied with the fact that he was personally copying Stalin in many ways starting from uniform up to manner of behaviour (Yudin, 1956; Zhirnov, 2012:56). The actual relationship between the two countries was immediately affected with regard to the border guard service. For instance, the earlier dissolved Soviet Command of the Eastern Border Guard Service (Rus: *UPV KGB Vostochnogo Okruga*) was

[79] The North Atlantic Treaty Organisation formed in 1949. As reaction to the integration of West Germany into NATO, in 1955, in the capital city of Poland, the Soviet Union and Eastern Bloc of socialist republics signed the "Treaty of Friendship, Cooperation and Mutual Assistance" know as Warsaw Pact (Rus. *Varshavsky dogovor*).

restored on 28 June 1957 with headquarters in Alma-Ata, with troop centers in Frunze and Osh cities. The troops were responsible for the borderline (4,175 km) between the Altai, Tuva Autonomous Soviet Socialist Republic, Kazakh, Kyrgyz and Tajik SSR with China. In 1958 the Chinese anti-Soviet mood was raised in the open (Kreutzmann, 1995:215).

There were number of demonstrations in front of the Soviet embassy and provocations at the border. In addition, with the Berlin crisis between 1958 and 1962, this was a time when divergences between the two big socialist countries started to appear. During Khrushchev's last visit to China in 1959, the lack of rapport between the two leaders was already obvious (Troyanovsky, 2000:223). With worsened relations, the border issue became a major problem. In 1964, the Chinese leadership claimed their rights and demanded up to 1.5 million km^2. There were 22 disputed sections, 16 of them in the western area and six in the eastern part of the Soviet-Chinese border. The Chinese government said that a number of territories in the regions of Primorye, Tuva, Mongolia, and the republics of Central Asia were transferred to Russia as a result of unequal treaties imposed on China when it was in a weak position.

In connection with the celebration of the anniversary of the "October Revolution of 1917", in November 1964 a Chinese delegation visited Moscow. After the removal of Khrushchev from power, both sides were seriously willing to discuss the conflicts relating to border issues. However, the negotiations ended with no resolution on the border problems, and the conflict worsened, developing into real armed conflict in 1969.

Military confrontation took place in March 1969 at Damansky Island in the Far East of Russia and in August 1969 at the border zone around Lake Zhalanash-Köl (verbatim empty lake) in Kazakh SSR (Eliseev, 2015). Later, during the negotiations in 1992-1996 on borders between newly independent Kyrgyzstan and China it became known that such conflicts took place in Kyrgyz SSR – People's Republic of China border part as well, but were not disclosed to the public (Kerimbekova, 2002:27).

During 1960-1970s, the Central Asian borderline with China was strengthened with the installation of alarm systems. By considering relief of the sites and for military-tactical reasons, fences were often constructed in rear territories (inlands) at a distance from the actual borderline.

The Cold War followed after end of World War II and increased the Soviet's military presence and priority in the western borders until the conflict with China. In the period of 1960-70s the active construction of defence means along the border with China took place, where the number of outposts was increased three times, and troop numbers and armoured vehicles increased eight

times (Tereshchenko, 2015:6). The outcome was that the extensive mountainous territory along the border became an artificial refuge for wildlife (Fig. 4.5).

Figure 4.5 The Control-Track Strip in combination with fence on the right to prevent 'false signal' due to wild species. The border zone in Erkechtam area in 1979
Source: Reproduced by kind permission of former soldier Andrei Korshunov from his personal album

The density of border guards at the Chinese border was increased by five times, from 0.8 persons/km in 1965 to four persons/km in 1969. Based on the archival material provided by the Russian Ministry of Foreign Affairs to their colleagues in Kyrgyzstan, it is known that the Kyrgyz pastoralists from the Chinese side, accompanied by troops every spring, were approaching the borderline. Kerimbekova (2002:22) noted that provocations and armed conflicts erupted in 1960 (Boz-Aigyr), 1970 and 1971 at Bedel pass, and in 1973 at Terek pass (watershed of Üzöngü-Kuush) (ibid:36).

Most probably, in connection to these events by Decree of the Presidium of the USSR on 25 February 1974, the Eastern Border Guard Service was honoured with the Red Banner Award for successful duties. Interestingly, on 29 September 2019, the Chinese international English-language news channel China Global Television Network, televised a national awards ceremony to celebrate PRC's 70th anniversary, where the General Secretary Xi Jinping handed to the woman Burmakan Moldo kyzy[80] the high state award of "The People's Role Model". A speaker announced

[80] Burumahan Maoleduo in Chinese version of transliteration. See "Recognizing the heroes of 70 years of the PRC" https://www.chinadaily.com.cn/a/201908/31/WS5d69a5c7a310cf3e35568e94_9.html updated on 31.08.2019.

that “She has patrolled the borderline an average altitude of more than 4,000 meters, for over five decades and mobilised her village in joining the patrolling. She has made a major contribution to national defence”. It also became known that she is from Ulugchat county of Kyzylsuu Kyrgyz Autonomous prefecture in the far western Xinjiang Autonomous Region, bordering with Kyrgyzstan (Sputnik, 2019).

From the side of the Naryn oblast of Kyrgyzstan, there is evidence from villagers of the former Lenin kolkhoz in Naryn rayon that prior to the 1970s they were annually driving sheep flocks to summer pastures in Üzöngü-Kuush.

> Flocks start to move from 1st of May. It takes 15 days from kolkhoz to summer pastures in Üzöngü-Kuush. Since 1970s, we stopped to practice this, and we were changed to another summer pasture.
>
> Orozbek Alchikenov (born in 1962), Tash-Bashat village, 2018

The border zones opened for visitors only in 1989, and since then the practice of trophy hunting began in Kyrgyzstan. According to Koshkarev (2002:2) almost 70% of the population of argali, ibex, snow leopard, Pallas’s cat – manul (*Otocolobus manul*) and other rare wild species in Kyrgyzstan were concentrated in the border zones described above.

Since the dissolution of the Soviet Union, China has raised territory claims to the neighbouring Central Asian republics. In 1996 and 1999 Kyrgyzstan and China signed two treaties on borders (Box 4.1). When border issues were resolved with China, border fences year by year started to disappear in the Arpa highland valley, mostly dismantled by local pastoralists. Later, since 2000, border fences were partly demolished as well in the Aksai highland valley area. In these vast territories 33 new hunting companies were established in addition to the already functioning 66 companies.

Box 4.1 Border Delimitation with China

The border delimitation and demarcation between Kyrgyzstan and China goes back to the Soviet era. After political relations were interrupted in 1958 and armed confrontations became a threat for both, an official negotiating process on borders between the Soviet Union and the People’s Republic of China started in 1964. The situation on the border was intense and consultations between 1969 and 1979 could not resolve the issues. The resumption of negotiations in 1987 followed the first high-level meeting in Peking, where the two sides framed the principles for border delimitation (Kerimbekova, 2002:23).

The basis for delimitation between the USSR and the PRC was enshrined in documents signed between the Russian and Chinese Empires. There are the Peking Additional Treaty (1860) on general description of borders in Central Asian part, the Chuguchak Protocol (1864) on natural geographic reference points, the Saint-Petersburg Treaty (1881)[81] on border signs between Fergana and Kashgar regions. Later the Novo-Margelan Protocol (1884) on frontiers following the main ridge of Tien-Shan Mountain. After the collapse of the Soviet Union in 1991, China announced that there would be separate negotiations with each of the new independent States. This approach provided advantage to China. Nevertheless, through diplomatic dialogues it was possible to reach agreement to the format of the "Joint delegation-China". This pathway provided access for the Central Asian countries to archival materials, maps, protocols and other related historical information from Moscow.

During 1992-1996 the Commissions identified twenty-five sites (with total area 34,000 km^2), of which five disputed sites were in the territory of Kyrgyzstan (3,750 km^2). By 1996, compromise was found on territorial areas around the peaks of Khan-Tengiri and Pobeda (Kyr. *Zhengish Chokusu,* Eng. *Victory Peak*), Maibash-Too, Boz-Aigyr and Erkechtam. Agreement on the largest plot of five disputed sites was around the watershed of Üzöngü-Kuush River (2,840 km^2) and was reached later. The Chairman Jiang Zemin, and the President Askar Akaev, signed the Additional Treaty between the Kyrgyz Republic and the People's Republic of China About the Kyrgyz-China State Borderline in Bishkek on 26 August 1999 (Ratified by Law No. 88, on 25 May 2002). As a result of that, 70% of the disputed territory in Üzöngü-Kuush remained in Kyrgyzstan and 30% went under the jurisdiction of China (Kerimbekova 2002:24). The agreement was assessed by the public as a loss of historic territories, and generated rumours that this land was "sold out", the following debates and confrontations contributed to President Akaev's overthrow in 2005.

Zvezhinsky et al. (2007:8) notes that the first Signal System (SS) established since 1947 at the border was the system SS "*Klyon-M*", originating from the Russian word maple tree (the index M means modernised). The system came from the internal troops of the Ministry of Internal Affairs where they used it in correctional facilities.

Since 1955, the border guards used complex *S-100* "*Skala*" (index S means "*Sistema*" in Russian, *Skala* is a rock) which was a modernised version of the previous model. In 1975, it was replaced

[81] Based on this Treaty, Russia left the Kulzha city, which was occupied earlier, but reserved the western part of Ili region with the marked borderline of the Khorgos River (Kaz. *Qorgas* – to jointly defend). Many Uighur and Dungan peoples out migrated and settled in the territory of the Russian Empire. Nowadays these peoples are among large diasporas of the Central Asian republics.

with the much improved *S-175* "*Gardina*" system which was first constructed in the Central Asia-China border areas. The last Soviet alarm system was *KS-185* "*Gobi*" where the visual difference is that the poles are metallic or concrete instead of wood and could be without a T-form visor.

Barbed wire fences were mantled on poles (up to 2.5 m height from the ground at 3 m intervals) and regularly maintained. However, in Kyrgyzstan after 1999, most of them were abandoned and in many places where dismantled by the local inhabitants and used for the construction of livestock corrals. Before 1999, the borderline with China was guarded by border personnel from the Russian Federation, until Kyrgyzstan established its own State Border Guard Service. This coincided with the signing of the Additional Treaty on borderline (1999) between Kyrgyzstan and China. With regard to, Tajikistan, due to its civil war, issues on the border with Afghanistan, and its economic situation, only took control over the border with China in 2004 and therefore in some areas fence infrastructure remained in the Eastern Pamir.

To construct such facilities on one kilometre length of fence 334 wooden poles of three metres height were necessary, along with 2.5 ton of barbed wire, over 12,000 plastic isolators and 60 kg of nails. In harsh climatic conditions the 'sistema' should be renewed after every five years, especially the cables and insolation materials which were not resistant to solar radiation and cold winters in the high mountains. Late in the 1980s, to prolong the lifetime of wooden poles, they were processed with *anthracene oil* or *creosote*, which possesses better insulating and preservation properties than before (Zvezhinsky, 2007:4). Nowadays Kyrgyzstan is not planning such expensive projects on its borders.

The signal system was problematic in case of a 'false alarm' due to wildlife. Therefore, the complex was combined with "*Elektropulsar*" – a simple autonomous electric fence line to frighten off the large animals such as wild boar, bear and other large animals. This approach was not used everywhere, and another popular solution in decreasing the wildlife impact on the alarm system was the presence of small passes 25x30 centimetres in size at 50 metre intervals (Zvezhinsky et al. 2007). It was passable only for small size species but there is evidence that large mammals, especially horned migratory wild herbivores such argali, have become stuck on the fences. Nevertheless, according to the opinion of many biologists, this vast territory became a refuge for wildlife and by the estimation of Koshkaev (2002) these territories were rich for 'undisturbed wildlife'. However, this situation later changed with the onset of trophy hunting since independence.

4.4 Wildlife resource utilisation

The Russian researcher Markov (1901) mentions that for a long time, Kyrgyz pastoralists were combining their livelihood with the utilisation of wildlife resources. Indeed, hunting was a part of the daily livelihood. Five months of the calendar in Kyrgyzstan are named after wild ungulates. The months of March and April in Kyrgyz language are *Zhalgan kuran* – "false roebuck" and *Chyn kuran* – "true roebuck" respectively. This comes about because in March these ungulates shed their antlers. From a distance it is difficult to distinguish between a female and male roe deer. By April the roebuck has already newly formed antlers and is referred to as the "true roebuck". The months of May, June and July are called *Bugu* (stag), *Teke* (male ibex) and *Kulzha* (male argali) respectively and are explained by their behaviour in nature at a given time. For instance, May is the birthing period of the maral. Stags move to a higher altitude and already have formed their antlers. They escape from flies to protect their velvets (J. Kyrbashev, personal communication, 2018), while argali are forming separate groups consisting of only males.

Kyrgyz pastoralists hunted species that provide meat, fat, skin or fur. For instance, the skin of the argali was highly valued, because of *chombar* (galligaskins) being superior for its waterproofing qualities for clothes than other types of skin. In his essay from traveling in Alai Mountains, Markov (1901:144) mentions, "Kyrgyz surprisingly value a leather from argali. Because from that leather they make durable and waterproof chombars. The chombar is important thing for travel and combat outfit of Kyrgyz. Here in the mountain trek with the Kyrgyz, under the spring rain, […] I understood and fully appreciated the irreplaceable benefit of waterproof and sealed in the bottom thing and on top, is very convenient under robe, everything is comfortable for Kyrgyz, to tightly sit on the saddle, deftly jump down and up, and easily climb in mountains [for hunting]".

Interestingly, Marco Polo, the legendary Venetian traveller of the thirteen's century, on the way to the court of Kublai Khan, provided a brief description about the argali.

> "… Here is the best pasturage in the world, for a lean beast grows fat here in ten days. Wild game of every sort abounds. There are great quantities of wild sheep [argali] of huge size. Their horns grow to as much as six palms in lengths."
>
> "… From these horns the shepherds make big bowls from which they feed, and also fences to keep in their flocks. There are also innumerable wolves, which devour many of the wild rams."
>
> quoted in Shahrani (2002:26)

His narrative of them as great sheep with huge size of horns, which grow to as much as six palms in length, however, the public perceived this as an exaggeration. Centuries later, the British

zoologist Edward Blyth who had for a long time worked in India, based on a sample hunted by Lieutenant John Wood from the area of Zor-Köl Lake in 1838, delivered the first scientific description of argali. He gave the scientific name as *Ovis ammon polii* in honour to the first European traveller who reported on these sheep (Kharitonov, 2009). Argali live over a vast geographic range and is found in many countries such as Afghanistan, China, northern India, and mountainous parts of Kazakhstan, Kyrgyzstan, Mongolia, Tuva and Altai Republics of the Russian Federation, eastern Uzbekistan, and eastern Tajikistan (Harris and Reading, 2008). The name *argali* comes from the Mongolian language, where it means ram and refers to the largest sheep species in the world (Schaller, 2012:260). In the Kyrgyz language all wild ungulates generally are called *kiyik*, where the female wild mountain sheep is called *arkar* and the male is *kulzha*.

The argali, or widely known as Marco Polo sheep, share much of their living space with ibex and are listed as among the main wild prey of snow leopard and wolves. Wild sheep were always sought after by humans as a source of meat and pelt. Their population was in competition with domestic animals, mainly from mobile pastoralism in the highland pastures (Kharitonov, 2009; Schaller, 2012; Schaller and Kang, 2008).

Historically, hunting was a source for not only meat but also used for entertainment of the elite. Once, hunting of argali had contributed to establishing good relations between the Kyrgyz of the Afghan Pamirs and the political elite of Kabul. As in early 1960s, the King of Afghanistan Mohammed Zahir Shah (reigned 1933-1973) together with his courtiers came to the Pamirs to enjoy the hospitality. This visit resulted in the setting up of a trophy hunting reserve in the Great Pamir operated by the Afghan Tourism Organisation (Shahrani, 2002:43-44). Later in 1967, foreign trophy hunters began to hunt this species in Mongolia (Lkhagvasuren et al. 2016:453).

Nowadays the Kyrgyz Government permits and allocates a certain number of hunting licenses for various wildlife species (Table 4.5). Generally hunting activity is regulated under the Law “About Animal World” (1999) and the Law “About Hunting and Hunting Economy” (2014).

Table 4.5 List of permitted game species in Kyrgyzstan

No.	Name of species		
	In English	In Kyrgyz	In Latin
1	Siberian ibex	Teke (male), Echki (female)	*Capra sibirica*
2	Roe deer	Kuran (male), Elik (female)	*Capreolius pygargus*
3	Wild boar	Kaman (male), Donguz (female)	*Sus scofa*
4	Jackal	Chöö	*Canis aureus*
5	Wolf	Karyshkyr	*Canis lupus*
6	Corsac fox	Korsak or Kichine tülkü	*Vulpes corsac*
7	Red fox	Tülkü	*Vulpes vulpes*

8	Altai weasel or solongoi	Solongoi	*Mustela altaica*
9	Least weasel	Arys chychkan	*Mustela nivalis*
10	Stoat	Chong arys chychkan	*Mustela erminea*
11	Steppe polecat	Ak küsön or Sasyk küsön	*Mustela eversmanii*
12	American mink	Amerika suugundusu or Norka	*Mustela [Neovison] vison*
13	Badger	Kashkulak	*Meles meles*
14	Asian steppe wildcat	Ala myshyk	*Felis libyca*
15	Eurasian red squirrel	Tyiyn chychkan	*Sciurus vulgaris*
16	Yellow ground squirrel	Sary chychkan	*Spermophilus fulvus*
17	Relict ground squirrel	Kaldyk sary chychkan	*Spermophilus relictus*
18	Grey marmot	Kök suur	*Marmota baibacina*
19	Long-tailed marmot	Kyzyl suur	*Marmota caudata*
20	Muskrat or ondatra	Ondatra	*Ondatra zibethicus*
21	Tolai hare	Koyon	*Lepus tolai*
Birds			
22	Snowcock	Ular	*Tetraogallus himalayensis*
23	Pheasant	Kyrgool	*Phasianus colchicus*
Red Book species			
24	Argali or Marco Polo sheep	Kulzha (male only)	*Ovis ammon polii*
	A wildlife species listed in the Red Book of the Kyrgyz Republic, other birds of prey and songbirds are allowed only with a special limitation on the amount of seizures. The annual limit is no more than one percent of the total number of their populations throughout the republic.		

Source: Compilation based on "Hunting Rules in the Territory of the Kyrgyz Republic" adopted by the Government Resolution No. 143 on 23 March 2015 (as amended by the Government Resolution No. 383 on 19 June 2017)

Hunting activity can be classified into sport-amateur or recreational, commercial, regulatory and trophy hunting. The sport and recreational hunting category covers most hunters, as a rule, as they hunt small species such as pheasants or hares for self-consumption, where they are available in large numbers and at affordable prices. Commercial hunting (Rus. *Promyslovaya okhota*, Kyr. *Mergenchilik*) is a professional activity of income source generation, and carried out for the purpose of meat, fat, peltry, leather and other products of animal origin. Regulatory hunting is an activity to regulate the population of some specific species, where these are usually a pest animal or birds. Trophy hunting is the selective shooting of game species according to a specific license where the motivation is to hunt the most remarkable individual animal of a particular species with unique characteristics. High prices make it from the economic point of view, the highest income generating type of hunting.

In Kyrgyzstan, argali (*Ovis ammon*), despite having a national 'Endangered' status, has been legally hunted under licence since the early 1990s in the quantity of between 30-115 argali annually. According to Kuznetsov (1948:116), in the past, the argali population was plentiful in the Alai Valley. During the winter of 1933-1934, soldiers of Bordöbö border post (see Fig. 1.4)

were able to kill many argali for meat. By spring, a truck model of GAZ-AA was full of argali horns with skulls. Also, it is known that during December-March of 1933-1934, soldiers harvested seven tonnes of meat, which is around 140 head at an average argali body weight of 50 kg. Around the Erkechtam outpost, two local hunters harvested eight argali within two days.

Due to the intensive use of pastures of the Alai Valley by large numbers of livestock during 1960-80s the number of argali population decreased significantly. The latest data indicates that there are around 200 argali left in the Alai and Chong-Alai Ranges (Davletbakov et al. 2016:420). According to local respondents, due to the low population density within the Alai Valley, they go to the area of Kara-Köl, whereas in the Pamirs of Tajikistan, the argali population is estimated to be over 24,000 (Saidov et al. 2016:435).

Another iconic wild ungulate is the subspecies of Siberian ibex, known under scientific name as *Capra sibirica alaiana,* being the largest subspecies in size. The ibex population is the most numerous among the wild ungulates of Kyrgyzstan. According to Fedosenko and Blank (2001:3), ibex population was estimated as 80,000 during the middle 1980s. The latest data shows there are 47,668 ibexes of which 6,103 are distributed in the Alai and Chong-Alai Ranges (Davletbakov et al. 2016:420). The male ibex can weigh up to 130 kg, and they grow big and massive horns of around 150 cm in length, which is what attracts many hunters[82].

Despite its association with the Alai region in name, this subspecies is distributed beyond the region, and inhabits the Pamir, Tian-Shan and Zhungar Alatoo Mountains (Fedosenko and Blank, 2001). They are referred as key wild prey for snow leopard and wolf (Jumabay-Uulu et al. 2013). Beside of hunting, in the past the ibex species were used in goat breed improvement by the Academy of Science of the Kazakh SSR (Yanushevich et al. 1972:412).

In Kyrgyzstan, ibex can be hunted legally under licence however most are shot illegally and in large number. Previous studies highlight the poaching of large numbers (Watanabe et al. 2010) which has greatly reduced their population including their extinction in the Sary-Tash area of the Alai Valley (Izumiyama et al. 2009:18). In addition to poaching, deep snow during hard winters has had a negative impact on the ibex population (Weinberg et al. 1997:182), by making them easy prey for wolves.

In Kyrgyzstan, the most popular commercial game species were marmots. There are three species namely, grey (*Marmota baibacina*), long-tailed (*Marmota caudata*) and Menzbier's marmot (*Marmota menzbieri*). Due to the limited distribution in the Chatkal Mountains and intensive

[82] In Kyrgyzstan known record of the horn length is 164 cm among ibex and 165 cm among harvested argali trophies (A. Davletbakov, personal communication, 2020).

hunting pressure, the Menzbier's marmot became protected since 1975 (Mamytov et al. 1985:16).

It is also known that rodent species are a source of bubonic plague, which is an acute life-threating disease to humans caused by the bacterium Yersinia pestis which is transmitted by their attendant fleas (Drancourt, 2013:584). In the wild nature, marmots are the main carriers of this zoonotic disease and in 1937 with the purpose of systematic observations the Frunze Anti-Plague Station (Rus*. Frunzenskaya protivochumnaya stantsiya*) was established in Kyrgyzstan. Nowadays it operates as the Republican Center for Quarantine and Special Dangerous Infections under the Ministry of Health of the Kyrgyz Republic. There are regional branches in At-Bashy town, and Talas, Osh, Karakol cities (see http://rckooi.kg). In 2013 there was one case of bubonic plague infection registered that ended with the fatality of a 15-year-old boy in the highland pasture in Ak-Suu rayon of Yssyk-Köl oblast. It was reported that he had eaten meat from a marmot and was hospitalised five days after being infected (RIA Novosti, 2013). The Anti-Plague Station regularly organises field observation in such areas and in the Soviet times supported the hunting campaign of marmots. It was estimated that over one million grey marmots were eradicated during the 1950s and 1960s in the Aksai Valley of Naryn oblast (Yanushevich et al. 1972:120). Prior to 1961, the grey marmots harvest was up to 100,000 annually, but then dropped to 57,000 by 1968 (ibid:129). This campaign was conducted to eradicate sources of plague disease. However being as an important natural prey for wild predators, as well as large predatory birds, the decline of marmot populations impacted on them.

Within the southern part of Kyrgyzstan is found the long-tailed marmot species. In Alai Valley there was estimated to be 400 thousand long-tailed marmots (Kyr. *Kyzyl suur* – red marmot) in 1934 (Kuznetsov, 1948:21). There is no detailed study report about its present status in Alai. According to the State Agency on Environmental Protection and Forestry, in 2017 the population of marmots, including all three species, was estimated to be 274,711 individuals.

In the Soviet times, marmots were harvested in large numbers by request of the SOJUZPUSHNINA[83] and were mainly trapped for their pelt and fat.

[83] The monopolist state organisation of the Soviet Union in fur trading was founded on 24 October 1931 with headquarters in Leningrad (St. Petersburg). In 1989 it was reorganised as the State Company "NOVOEXPORT". By 2003, it was fully privatised under its previous name of "SOJUZPUSHNINA" and functioned as the single private company in Russia that organised the International Fur Auction in St. Petersburg. In the 1960-1980s it was in a lead position in the world fur market providing millions of hides. For example, in January 1976, over 2.2 million pelts of different kinds were displayed and sold. At that time the annual volume of sales at auction reached over 150 million USD, see http://www.sojuzpushnina.ru/en/s/50/history.html

In the past, hunting on marmots was well organised.
Every hunting brigade had a plan and in autumn my group was harvesting 1,200 marmots.
Procurement office [Rus. *Zagotkontora*] was in Gülchö town
Abdykadyr Isaev (born in 1963), Chak village, 2015

It was centrally organised with a fixed price, and hunters were not worried about the market where to sell a harvest. In the Alai Valley there were annually harvested 10,000-15,000 marmots, which made significant change to their population and distribution. For instance, between 1940 and 1960, the density of marmots dropped from 12 to 1.5 animals per hectare, respectively (Yanushevich et al. 1972:131).

Marmots are seasonal prey of many wild predators and play a significant role in the diet of brown bear, snow leopard and wolf (Anarbaev et al. 2019:16). They eat marmots in high numbers in spring and autumn, before the marmots go into hibernation. Many local respondents have highlighted that, marmots are very crucial for pastoralists as well, because they bear most of the food demand of wolves for instance.

Wolves are our main problem in winter. Since start of spring when marmots are already waking up, livestock is less attacked by wolves. In the past marmots were hunted in many numbers, now they are slowly increasing
Asatilla Momunov (born in 1955), Kashka-Suu village, 2015

Such observation was made by Shahrani (2002:109) as well, who was studying Kyrgyz pastoralists in the Chong-Pamir and Kichi-Pamir Mountains of Afghanistan. According to him the Kyrgyz population had little interest in hunting of marmots, "although they are numerous during the warmer months when they are out of hibernation, does in fact save the herders much livestock since wolf packs feed on marmots rather than attack the Kirghiz flocks and herds" (Shahrani, 2002:109).

Rodent species are renowned for the damage they cause to cropland. As a rule, marmots do not disturb crops in the region, as they are not abundant in settlement areas because of dogs.

Generally, the meat of marmot is considered as impure. However, its fat is widely used in traditional medicine as a cure for cold or skin disease. In the summer-autumn period marmots are hunted in some numbers also as food for shepherd dogs.

Another game species that occurs in the Alai is the wild boar (Kyr. *Kaman*, Rus. *Kaban*), which is disliked by the pastoralists because it digs the pastures. According to Yanushevich et al. (1972:381), Central Asia is home to the wild boar subspecies classified as *Sus scrofa nigripes.* It is considered bigger in size and lighter in colour than other subspecies of boar. In Kyrgyzstan, wild

boar is distributed sporadically everywhere, except in the highly populated Chüi valley with its intensive land use, where wild boar was last hunted in 1957. Researchers, Chichikin and Vorobyov (1967), studied wild boar in Southern Kyrgyzstan. The body weight of wild boar over 3 years in age is: female 90-120 kg and male 130-243 kg accordingly. Particularly in the Alai Valley this species is found in the Western part and is considered as valued game. As a rule, despite the existing word referring to pig, this beast is not named as pig or even wild pig, but generally called as *kara kiyik* in Kyrgyz language, which can be translated verbatim "big or large ungulate". The names *kaman* and *donguz* refer to the male and female species respectively. According to Islamic rule it is termed 'haram' meaning impure, but this aspect is less held by most Kyrgyz pastoralists and hunters. Therefore hunters from Alai are regularly invited to the neighbouring Zhergetal rayon of Tajikistan to hunt them, where local peasants are struggling due to crop damage caused by wild boars. It was reported that people in that part of the country are more religious and do not use them.

4.5 A new wildlife conservation agenda

On 23 October 2013, the President of the Kyrgyz Republic hosted the Global Snow Leopard Conservation Forum in Bishkek. This event was promoted by many leading NGOs and international donor institutions that have interests in the region (Fig. 4.6). The forum was attended by representatives from snow leopard distribution countries including Afghanistan, Bhutan, China, India, Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, Russia, Tajikistan and Uzbekistan, and a delegation from Yemen.

Figure 4.6 Government officials and representatives of the international organisations gathered in Bishkek to discuss the Global Snow Leopard and Ecosystem Protection Program
Photograph: M. Anarbaev, 2013

International organisations were represented by the Global Environment Facility (GEF), World Tiger Initiative, Nature and Biodiversity Conservation Union of Germany (NABU), Snow Leopard Conservancy, Snow Leopard Trust, Panthera, United Nations Development Program (UNDP), TRAFFIC, USAID, World Bank, WWF and many others. At this Forum it was declared that about 190 million USD had been allocated for Snow Leopard Conservation Projects in the snow leopard habitat countries (Snow Leopard Working Secretariat, 2013).

As an outcome of the forum, the Bishkek Declaration was endorsed by the governments of twelve snow leopard range countries and boosted many projects under the umbrella of snow leopard conservation. The Bishkek Declaration set a goal of ensuring that there should be at least 20 protected snow leopard habitats by 2020 and it led to the formation of the Global Snow Leopard and Ecosystem Protection Program (Box 4.2). Since then, October 23 is commemorated each year as International Snow Leopard Day.

Box 4.2 Global Snow Leopard and Ecosystem Protection Program

The program is to address high-mountain development issues using the conservation of the snow leopard as a flagship species. The snow leopard is promoted as an indicator of healthy high-mountain ecosystems in Central and South Asia, which support the cat itself, its prey, and a vast amount of biodiversity. It also emphasises that the snow leopard, as the apex predator, shares the landscape with humans who depend on various forms of agro-pastoralism. The program focuses on themes such as engaging local communities, reducing human-wildlife conflict, managing habitat, controlling poaching of snow leopards and other prey species. Among the anticipated outcomes of the program is reduction in livestock predation and mortality, decreased killing of snow leopard and prey (Snow Leopard Working Secretariat, 2013). In advance of the Global Snow Leopard and Ecosystem Protection Program in Bishkek, the Kyrgyz Government adopted the National Strategy on Snow Leopard Conservation in the Kyrgyz Republic for 2013-2023 years (Decree No. 732 from 19 October 2012).

From an ecological point of view, the snow leopard serves as an indicator of a healthy mountain ecosystem. Moreover, the snow leopard is a culturally valued wild species in Kyrgyzstan. Locally they are called *ilbirs*, and the male is *bars*. This animal associates with the ruler Barsbek Kagan who lived in the eighth century in the upper streams of the Enisei River basin and is acknowledged as a cultural symbol. The snow leopard is depicted on the coat of arms of the capital city of Bishkek. Environmentalists use the snow leopard as an “umbrella”, “ambassador” or “flagship

species" for the cause of nature conservation. The Soviet drama film "The Descendant of the Snow Leopard" (1984) directed by Tölömüsh Okeev, advocates for wildlife conservation. The world-renowned writer, Chyngyz Aitmatov, in his last work "When Mountains Fall or Eternal Bride" (2006) also calls for more respect for nature. Through the tragic fate of the snow leopard and hunter he describes the importance of protecting wildlife and living in harmony with Mother nature.

The habitat area of snow leopard in Kyrgyzstan is estimated at 105,400 km2 (Koshkarev, 1989:91), which equates with almost 53% of the land area. Besides the existence of Protected Areas, most of this land is designated as pastures and used for livestock grazing.

In the past, snow leopard was listed as a free hunting species. Since 1948 hunting of snow leopard without a licence was prohibited and in 1959 a penalty was introduced for its illegal harvest. Traditionally snow leopard is considered a magnificent, charismatic, and elusive game species. Only experienced and knowledgeable hunters could hunt them. Later, due to the rapid decline in its population, in 1975 it was listed in the Red Book of the Kyrgyz SSR (Toropova, 2006:511). Before that Kyrgyzstan was the main provider of snow leopard peltry within the Central Asian republics of the Soviet Union (Table 4.6).

The number of hunted snow leopards could have been higher, due to a high demand for its pelt, which is used to decorate coats, and for carpet in the house. Poaching of snow leopard is mainly driven by the high price of its peltry. For instance, according to Koshkarev (1989:38) in the past (1980s) one pelt was exchanged for five - seven sheep, or one yak or colt and in monetary value up to 800 roubles. Therefore, many harvested pelts that stayed in the hands of hunters were not recorded. Nowadays this sum might vary between 2 - 5 thousand USD.

Table 4.6 Numbers of harvested snow leopards in Central Asia

Purpose	Numbers
Commercial hunting, peltry	*2350*
Semirechie (1884-1910)	1131
Kazakhstan (1925-1966)	161
Kyrgyzstan (1925-1966)	633
Tajikistan (1953-1968)	425
Illegal hunting, poaching	*88*
Kazakhstan, Kyrgyzstan and Tajikistan (1962-1986) by trapping	48
Shot under predatory attack on livestock	24
Shot under sudden encounter	16

Source: Compilation based on Koshkarev (1989:33-35)

The coat of snow leopard is a white to greyish pelage with a unique pattern of dark flecks which is used to identify individuals. Its most remarkable feature is its extremely long tail which is more than 90 centimetres in length. The tail constitutes almost 90% of head-body-length. This makes the snow leopard tail as one of the longest tails among all felidae. In the harsh highland conditions, it is used for balance during hunting and as a scarf to sustain insulation from the cold (Rieger 1984:85).

Snow leopard harvesting for peltry purpose was in decline. By 1956, the Soviet Union was able to offer 100 snow leopard pelts in the auction of Leningrad (St. Petersburg) organised by SOJUZPUSHNINA (Koshkarev, 1989:34). In 1967 only 10 pelts were offered and quickly sold out for 175 USD per piece while in earlier years the price was much lower (Zverev, 1980:12). The hunting for peltry purpose was replaced with live trapping from 1960 because of the increase in demand for snow leopards for zoos (Fig. 4.7). The Soviet Union was a main provider of wild-caught snow leopards and 75% of them were trapped in Kyrgyzstan. Therefore, not surprisingly, most of the wild-caught snow leopards in the zoos of the world originate from Kyrgyzstan (Blomqvist, 1980:16).

The state agency called *Zoobaza* was dealing with live trapping for export to the zoos of the Western World (Table 4.7). Actually, it was a continuation of commercial hunting, and trading with live snow leopards was providing a greater income than selling their pelts.

Table 4.7 Numbers caught snow leopards in Kyrgyzstan and Tajikistan for export

Purpose	Numbers
For Zoos (1947-1988)	*475*
Kyrgyzstan (1947-1988)	354
Tajikistan (1947-1975)	121

Source: Compilation based on Koshkarev (1989:33-35)

However, the actual number of wild caught snow leopards is higher. According to Koshkarev (1989:37), around 11% of caught snow leopards died for various reasons such as injury sustained in trapping or during transportation.

Figure 4.7 A hunter catching trapped snow leopard in Kyrgyzstan in 1966
Photograph: E. Vilchinsky. *Source:* Reproduced by permission of RIA Novosti Archives

Among the wild-caught snow leopards almost 81% were trapped before the 1970s. Since the late 1980s, there has been a rapid decline in their population. For instance, within the 1985-87 period no snow leopards were caught and in 1988 only four were caught by *Frunze Zoo Kombinat* for demand by zoos (Koshkarev (1989:35). Nowadays a captive-breeding program is coordinated by the International Studbook Keeper (since 1976) which is responsible for maintaining a stable and self-sustaining snow leopard population in zoos (Blomqvist, 1995:184). Currently, there is little demand for wild caught snow leopard.

It is known that the main habitat of snow leopard is between 3,000 to over 5,000 m in the Himalaya and Tibetan Plateau (McCarthy et al. 2017:10). However, within Kazakhstan and Kyrgyzstan there were many cases, when snow leopards and their tracks were recorded at an altitude of 600-700 m above sea level during wintertime (Grachev and Fedosenko, 1975:123; Sosnovsky, 1987:107). In the Talas Alatoo range snow leopard was recorded at 1,200 meters (Novikov, 1956:276), in the Zailisky Alatau, Zhungar Alatau and Central Tien-Shan where they had

come down to an elevation of 1,200 meters to follow prey species (Heptner and Sludsky 1972:228).

The decrease in population was established as due to habitat degradation, poaching, killing in response to livestock depredation and natural prey depletion (Jumabay-Uulu et al. 2013:1). Nowadays, hunting, possession and trade of snow leopard are prohibited under the Law on the Kyrgyz Republic on Animal World (1999) and they are listed nationally as "Critically Endangered" in the Second edition of the Red Book of the Kyrgyz Republic (2006). The fine for illegal catch and hunting a snow leopard was increased from 199,640 KGS (US$ 3,992) to 1,500,000 KGS (US$ 21,500) in 2017. Species listed in the Red Book of the Kyrgyz Republic are generally protected but, in some cases, they can be taken from nature based on a special governmental decision. This might be for research or for reintroduction purposes back into the natural habitat.

In 2013, prior to the Bishkek Global Snow Leopard Conservation Forum, the Kyrgyz Government alongside to wildlife use fees, substantially increased the fine rates as well (Table 4.8). It was argued that this measure will decrease poaching and illegal trade activities.

Table 4.8 The penalty fees for illegal use of wildlife species

No.	Species	Penalty fees in KGS per head (1USD=80 KGS in 2020)		
		Since 1995	Since 03.05.2013	Since 18.08.2017
1	Snow leopard	199,640	500,000	1,500,000
2	Maral (Red deer)	4,173	400,000	1,000,000
3	Brown bear	12,700	400,000	1,000,000
4	Argali	14,135	400,000	1,000,000
5	Ibex	7,064	55,000	100,000
6	Roe deer	5,651	15,000	50,000
7	Red wolf, manul and lynx	5,000	25,000	50,000
8	Wild boar	3,000	15,000	50,000
9	Menzbier's marmot	1,391	3,000	20,000
10	Snowcock	200	2,000	6,000

Source: Compilation based on the Kyrgyz Government Decrees No. 224 on 03.05.2013 and No. 501 signed on 18 August 2017 "About penalties for damages to objects of the animal world" and unpublished data of the State Agency on Environmental Protection and Forestry, 2008

According to the Bishkek Declaration, the Global Snow Leopard and Ecosystem Protection Program identified 23 landscapes in the snow leopard range countries as key habitats to be secured for the cats. Among them the Alai and Khan-Tengiri mountainous region was defined as a priority within Kyrgyzstan. This environmental agenda has created a new impulse for

conservation projects in Alai Valley. Besides the planned Alai Nature Park, the Kyrgyz Government endorses the Community-Based Conservancies (Fig. 4.8). For instance, the USA based international organisation Panthera financially supported and facilitated the establishment of four community-based organisations for wildlife conservation in 2015. One in Kemin rayon in the north of the country, and three of them are in the Alai Valley, namely Ming-Teke, Zhanaidar and Bek-Tosot Community-Based Conservancies.

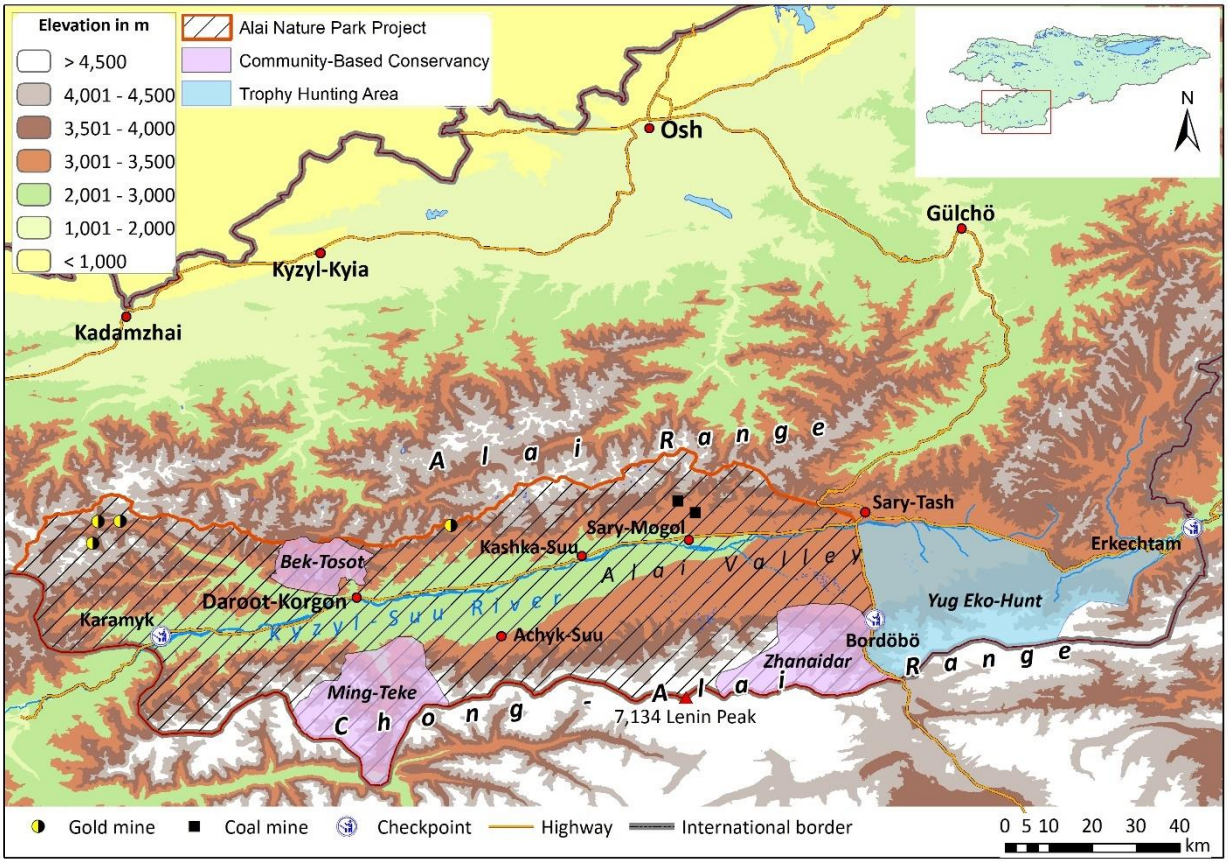

Figure 4.8 Alai Valley for wildlife conservation, hunting and pastoralism
Source: Based on topographic map of Kyrgyzstan (2006), own field survey (2015 and 2018) and Shuttle Radar Topography Mission (SRTM) elevation data. *Cartography:* M. Anarbaev

Another international organisation, the Snow Leopard Trust, has established and took patronage over the former wildlife sanctuary Shamshy in Kemin rayon of Chüi oblast. Nowadays the rangers of the above-mentioned community-based organisations receive educational, technical and training support from their sponsors. In the future they hope to obtain a hunting quota and host foreign hunters.

The decline in population of wild prey species creates uncertainty to the survival and thriving of snow leopard (Farrington and Tsering, 2020). According to a report of the State Agency on Environmental Protection and Forestry (2019), in Kyrgyzstan there is a total hunting ground of 14.77 million hectares, where 7.77 million ha is state owned land, and seven million ha belongs

to public and private hunting companies. In the beginning of the trophy hunting history in the country, there were around 30 hunting companies offering hunting tours for foreigners. An average cost of a hunting package of one-week program varied between 35-45 thousand USD. Later within the same hunting ground, the number of companies increased and before 2015 there were 74 hunting companies, comprising, three state and 71 public and private. Due to increased offers and competition for clients the price has dropped down to 20-25 thousand USD, making argali hunting in Kyrgyzstan the cheapest in the world. Since 2014 together with adoption of the new Law "About Hunting and Hunting Economy", which was facilitated by the Programme on Sustainable Use of Natural Resources (2012-2016)[84] of the German Corporation for International Cooperation (GIZ), the State Agency on Environmental Protection and Forestry stepped forward to enlarge the hunting companies' territory. Nowadays there are 50 operating hunting companies in Kyrgyzstan, of them only one is in the Alai Valley (see Fig. 4.8).

Snow leopard was declared as endangered in 1986 on the IUCN Red List, however in 2017, following a meeting of the Global Snow Leopard and Ecosystem Protection Program in Bishkek, the Cat Specialist Group of the IUCN Species Survival Commission (SSC) downgraded the snow leopard from the category of "Endangered" to "Vulnerable" within the IUCN Red List classification (McCarthy et al. 2017). This caused much discussion among local practitioners (Ale and Mishra, 2018). Some of them argued that it was necessary to show the "result" of conservation in front of the many donor organisations that spent a large amount of money for snow leopard conservation over the past many years. While others argued that the "Endangered" status is a useful tool to attract funds for environmental projects by using snow leopard as the flagship or ambassador species.

4.5.1 Trophy hunting as a conservation tool

The IUCN Species Survival Commission, a global network of conservation scientists, recognises that well-managed trophy hunting can provide both revenue and incentives for local people to conserve wild populations and their habitats, maintain areas of land for conservation, and protect wildlife from poaching (IUCN, 2012). The Global Snow Leopard and Ecosystem Protection Program also promotes the trophy hunting as a conservation tool for enhancing snow leopard prey populations through community participation and to mitigate human-wildlife conflicts (Snow Leopard Working Secretariat, 2013:18). However, in Kyrgyzstan trophy hunting has

[84] See https://www.giz.de/projektdaten/projects.action?request_locale=en_GB&pn=201122381

become a contested and sensitive issue that involves many interested parties. It is also facilitated by messages about negative impacts from the selective hunting reported in the international literature (Nordbø et al. 2017).

In Kyrgyzstan, trophy hunting became possible following independence in 1991 and generally associates with argali sheep (*Ovis ammon*), Siberian ibex (*Capra sibirica*), grey wolf (*Canis lupus*), roe deer (*Capreolus pygargus*) and wild boar (*Sus scrofa)*. Among them Marco Polo sheep and Siberian ibex are the most demanded trophy hunting species. The first hunting tours took place in Moldo-Bashy Mountain Range of Naryn oblast and later spread to Arpa and Aksai highland valleys (A. Davletbakov, personal communication, 2018). Among wild ungulate species, argali is an iconic animal and attracts hunters from all over the world because of the impressive and massive size of its curly horns. Therefore, not surprisingly it quickly became an object of international trophy hunting in Kyrgyzstan as well.

The argali is an ecologically and economically important wild ungulate (Schaller and Kang, 2008). It is the key wild prey of snow leopard and wolves, but it is the subject of trophy hunting.

There has been an increase in the harvest rate over the last 15 years and since 2005, the limit for argali and ibex increased several times. In 2005 the limit for argali was 26 animals and ibex 230, but by 2018 the hunting limit had increased to 70 argali and 350 ibex respectively (Table 4.9). The limits are based on an annual wildlife count and are fixed as 0.6% and 1.0% from the counted population of argali and ibex respectively. According to an assessment by the Kyrgyz National Academy of Science, this amount will not significantly affect the sustainability of the populations.

Table 4.9 Hunting limits for game species allocated in 2017

No.	Species	Hunting limit (heads)	Estimated population	Allowed limit, % from estimated population
1	Argali (Marco Polo sheep)	70	13,857	0.6
2	Ibex	350	34,443	1.0
3	Roe deer	30	3,832	0.4
4	Wild boar	60	1,207	0.4
5	Snow cock	80	26,728	0.3
6	Pheasant	1,900	19,656	10.0

Source: Based on unpublished Annual Report of the State Agency on Environmental Protection and Forestry, 2018

According to Government Decree No. 170 of 28 April 2005, the mountain sheep (*Ovis ammon)* is listed in the Red Book of Kyrgyzstan. The Kyrgyz National Academy of Science recognise three subspecies of argali occurring in the republic: the Marco Polo *(Ovis ammon polii)*, the Tien-Shan

(Ovis ammon kerelini) and the Severtzov mountain sheep (*Ovis ammon severtzovi),* known also as the Kyzyl-Kum wild sheep. Although this provides a general protection of the species, hunters can purchase a license to shoot the Marco Polo sheep. There are several loopholes in the legislation. For instance, the regulation on "Hunting Rules in the Territory of the Kyrgyz Republic" adopted by the Government Decree No. 143 on 23 March 2015, Annex II, says that a wildlife species listed in the Red Book of the Kyrgyz Republic, other birds of prey and songbirds is allowed with a special limitation on the number taken. The annual limit is no more than one percent of the total number of their populations throughout the republic. Another Law on "Fees and Order of Special Use of Wildlife Species in the Kyrgyz Republic" adopted by Government Decree No. 715 on 20 October 2015, place the argali's subspecies *Ovis ammon polii* in the list of game species. This means only one subspecies of argali that occur in the country can be hunted. In this regard, species classification remains an important aspect in wildlife management.

Since 1952 hunting on Tien-Shan argali was prohibited until 1968-1972 when limited licenses were allowed. In 1975, due to a decline in population by Decree of the Government of Kyrgyz SSR, this subspecies was included into the list of specially protected species (Mamytov et al. 1985:30). However, in 2005 in order to preserve rare and endangered species of animals and plants, the Government of the Kyrgyz Republic decided[85] to include all three subspecies into the Red Book. The largest population inhabits the Sarychat-Ertash State Nature Reserve, where, by some estimations around 2,600 animals were recorded in 2012 (Kashkarov, 2017:244). In other habitats they are much less.

Ecologists perceive that the hunting lobbies are manipulating the use of taxonomy with regard to the classification into subspecies. According to Sokolov (1986:452), the Tien-Shan mountain sheep (*Ovis ammon karelini*) is a rare subspecies (Table 4.10), which inhabits the Kyrgyz, Talas, Ak-Shyirak, Zhetim-Too, Küngöi and Teskei Alatoo Mountains of Kyrgyzstan. In these areas there are several hunting companies which enable argali hunting tours to take place.

Table 4.10 Estimated numbers of argali population in Kyrgyzstan

Subspecies	1985	2011	2018
Tien-Shan mountain sheep (*O. a. karelini*)	2,500-3,500	2,391	4,334
Marco Polo mountain sheep (*O. a. polii*)	6,000-7,000		13,857
Severtzov mountain sheep (*O. a. severtzovi*)		37	33
In total			18,224

Source: Based on Mamytov et al. 1985:29, State Agency on Environmental Protection and Forestry, 2016:111 [2011], Weinberg et al. 1997:192 [1985] and unpublished Annual Report of the State Agency on Environmental Protection and Forestry, 2018

[85] Decree No. 170 on 28th April 2005 "Approval of the lists on rare and endangered species of animals and plants for introduction to the Red Book of the Kyrgyz Republic".

In 2018 the Kyrgyz Academy of Sciences together with the State Agency on Environmental Protection and Forestry estimated that the general argali population was 18,224 within the borders of protected areas and hunting grounds. Among them a dominant portion was classified as Macro Polo sheep or Pamirian argali.

At the beginning of the 1930s, annually, up to four thousand argali skins were harvested in the Pamir. Actual numbers might be higher, because most of the harvested argali are used for the needs of locals. Until the mid-1980s, the local population of the Pamir, annually had a quota of 100-120 argali to hunt. Since 1987, the Tajik SSR included the species in its Red Book and stopped the practice of legal hunting by locals. However, this legal arrangement was weakly enforced in the beginning of 1990s and due to the socio-economic and political situation, poaching had reached over 1,000 argali killed every year (Fedosenko, 2000:157). Nowadays this numbers expected to be lower, because of the protective works of the Pamir National Park established in 1992 and the trophy hunting companies' rangers. However, by estimation of some experts and collaborators, annually, around 1,000 argali are taken by poachers (Rosen, 2012:18).

The argali is categorised as "Near Threatened" by the IUCN (2008) and listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora[86]. According to Harris and Reading (2008:2), the argali is believed to be in significant decline in population throughout Central Asia due to poaching and competition with livestock, making the species close to qualifying for the category of "Vulnerable".

The cost of a licence, their limited availability in the world, and hunting limits, has led to the exclusive character of trophy hunting. There are many hunters from over the world expressing interest in this species and sometimes hunters wait for an opportunity to obtain a trophy. However the rapid increase of hunting of argali has come under the focus of international wildlife conservation organisations and wildlife scholars. For example, the Secretariat of the UN Convention on the Conservation of Migratory Species of Wild Animals (CMS) based in Bonn, regularly organises information workshops and in 2012 launched a special program on argali in Central Asia known as Central Asian Mammals Initiative (CAMI)[87]. The Secretariat of CMS is already working together with many Central Asian countries and organisations to halt this trend, to ensure the conservation of the migratory species. In May of 2014 Kyrgyzstan became a Party to CMS and focused on additional targeted activities to improve the conservation of the species

[86] See https://cites.org/eng/app/appendices.php
[87] See https://www.cms.int/en/legalinstrument/central-asian-mammals-initiative-0

including the development of an International Action Plan for the Conservation of the Argali. The issue of wildlife conservation has been discussed by the Kyrgyz Government and has become highly politicised. Under the strong influence of local NGOs, facilitated by international agencies, there has been several efforts to ban trophy hunting of argali in the country. Recent public hearings by the Kyrgyz Parliament took place in the autumn of 2016, spring 2017 and autumn 2019, but the draft law on banning of trophy hunting has not been approved by the majority of deputies[88]. Nevertheless, the Kyrgyz Government has decided to apply limits on hunting for particular species of wild animals such as argali, ibex, roe deer, wild boar, and snowcock, within specific geographic locations. The break-up by regions in:

- 2017-2020 in Talas and Zhalal-Abad oblasts and four districts of Chüi oblast (Alamüdün, Sokuluk, Kemin, Zhaiyl rayons)
- 2020-2023 in Osh and Batken oblasts and other four districts of Chüi oblast (Chüi, Panfilov, Moskva, Issyk-Ata rayons)
- 2023-2026 in Naryn and Issyk-Köl oblasts.

Trophy hunting is an expensive pleasure and generally referred to as a sport for wealthy people. Hunters are organised into various associations or clubs that support and encourage trophy hunting. They have competitions with incentive schemes and offer medals or prizes. Many of them keep record books with the characteristics of hunted trophies. For instance, the Safari Club International is one of the famous hunting organisations based in USA, which has the most detailed record books. In addition to the hunting companies at the location, there are many trophy-hunting outfitters who link clients with their potential trophy and provide necessary services for the hunt. Companies facilitate in many ways the hunting process for their clients by customising each trip, advice with logistics, identify target species, and help with obtaining permits (International Fund for Animal Welfare, 2016:11).

Generally, a trophy-hunting package is expensive and in the case of Kyrgyzstan, the package for argali may vary from 20-35 thousand USD. As a rule, the hunting tour is planned for 7-10 days, and the cost includes local ground travel, accommodation, meals, permission papers related to the export of trophies, taxidermy and accompanying professional guides. The overall trophy hunting industry is well organised and advertised. In 2016 it was estimated that it had an annual financial impact of 3.75-4.5 million USD in wildlife use fees to the republic.

[88] Decree of Parliament No. 3301-VI on 23 October 2019 "About Rejection of the Draft Law of the Kyrgyz Republic On the Prohibition of Hunting for Certain Animal Species in the Kyrgyz Republic". See www.kenesh.kg

According to the enforced Law of the Kyrgyz Republic "About Hunting and Hunting Economy" in 2014, the wildlife use fees collected from the trophy hunting started to be distributed among three main stakeholders (Fig. 4.9a). This decision was driven by the purpose to engage local municipalities and to find consensus with Pasture Committees. For instance, the share of 25% licence fee for argali hunting is paid to the budget of the local municipality - Aiyl Ökmötü, according to which administrative territory in which hunting took place. The share of 35% goes to the budget of the State Agency on Environmental Protection and Forestry. Forty percent goes to the budget of the hunting company to co-finance their activities on conservation and wildlife reproduction works. However, in 2020 the Kyrgyz Parliament amended the law, changing the proportions to 35% and 65%, respectively, by excluding hunting company (Fig. 4.9b). Accordingly, the share to the local municipality increased and the State Agency on Environmental Protection and Forestry were obliged to use accumulated funds for the activities on wildlife management, monitoring, protection and reproduction of hunting resources.

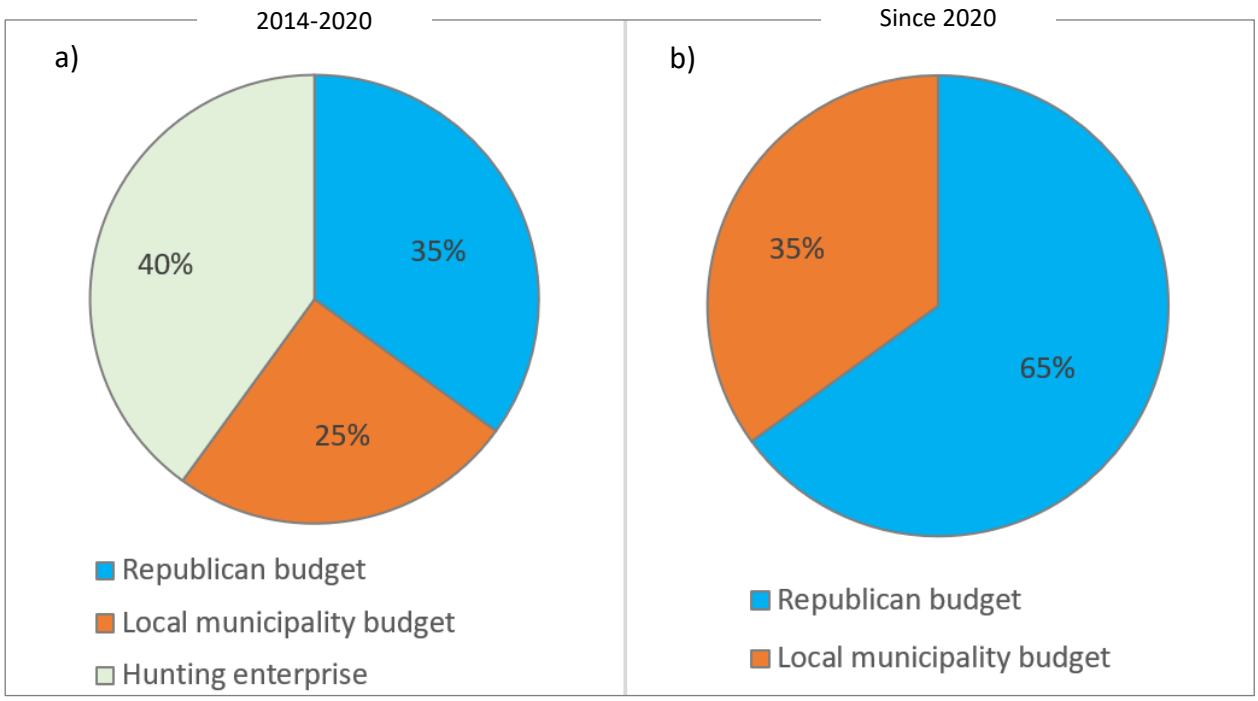

Figure 4.9 Distribution of the wildlife use fees generated from the trophy hunting
Source: Compilation based on the Law of the Kyrgyz Republic "About Hunting and Hunting Economy", 2014; 2020

The territories of many hunting companies comprise valued pastures for the pastoralists. According to the "Pasture Law" (2009), a hunting company can exclude livestock grazing and manage the territory livestock-free. In this situation, the amount of pasture use fee is agreed to and paid to the Pasture Committee.

Indeed, wildlife fees generate many discussions in society, and since 2015 the license fees have increased. For instance, previously Kyrgyz citizens paid a fee of 600 KGS to hunt ibex and now it is 10,000 KGS (Table 4.11). For foreign hunters the fee increased from 36,000 KGS to 70,000 KGS accordingly.

Table 4.11 The use fees for some key game species in Kyrgyzstan

	Name of game species	For Kyrgyz citizens, in KGS	For foreigners, in KGS
1	Marco Polo sheep or Pamirian argali (*Ovis ammon polii*), male species over seven years	450,000	450,000
2	Siberian ibex (*Capra sibirica*)	10,000	70,000
3	Roe deer (*Capreolus pygargus*)	8,000	30,000
4	Wild boar (*Sus scrofa*)	7,000	60,000
5	Badger (*Meles meles*), Asian badger (*Meles leucurus*),	500	2,500
6	Red fox (*Vulpes vulpes*), American mink (*Mustela vison*), Altai weasel or solongoi (*Mustela altaica*)	200	600
7	Marmots (*Marmota baibacina* and *Marmota caudata*)	60	250
8	Hare - tolai (*Lepus tolai*)	30	100
9	Jackal (*Canis aureus*)	No fee	5,000
10	Grey wolf (*Canis lupus*)	No fee	15,000

Source: Compilation based on the Government Decree No. 715 on 20 October 2015 about "Fees and order of special use of wildlife species in the Kyrgyz Republic". An average exchange rate is 1USD=80 KGS in 2020

After long public discussions that the region's "cheapest argali" is in Kyrgyzstan, the Government increased the fee from 250,000 KGS to 450,000 KGS. Moreover, it became possible for citizens of Kyrgyzstan to hunt argali, whereas before it was legally allowed only for foreigners and trophy hunting was called shortly as *Inokhota (*Rus*. Inostrannaya okhota* – foreigner's hunting).

Despite the fact that trophy hunting is considered an effective tool for wildlife conservation, there are a number of academic papers published on the impacts of trophy hunting on the population of wild ungulates (Coltman et al. 2003; Fedosenko, 2000; Kharitonov, 2009; Mallon, 2013; Rosen, 2012). Trophy hunting is selective, and hunters want only large, strong male wild ungulates with impressive horns. Removal of these animals from the reproduction process may impact on the genetic health of the argali population. For instance, Coltman (2003:655), based on his 30-year study of sport hunting of bighorn trophy rams (*Ovis canadensis*), highlights that 'trophy-harvested rams were of significantly higher genetic breeding value for weight and horn size than rams that were not harvested'. Consequently, unrestricted and insufficiently controlled trophy hunting may result in the production of smaller-horned, smaller ram trophies (Coltman et

al. 2003:656; Mallon, 2013:11). During 1978-1992, the harvesting of 201 argali rams from the central part of the Altai in Mongolia caused a visible impact on argali population with big horn sizes. Between 1987 and 1999 in the Pamir and Tien-Shan there were legally harvested 460 argali rams (285 and 175 respectively). This changed the population structure, because the decrease of adult males in the groups increases the proportion of young males participating in mating (Danilkin, 2005:388). In addition, a decline in trophy-sized rams in Kyrgyzstan has been mentioned in several reports (Rosen, 2012:14). These statements are also confirmed in Yssyk-Köl oblast.

It is true that since recent years, the size of trophies are small. Before we could easily get argali rams with 145 cm horn size. The minimum requirement for horn length of trophy was 120 cm, nowadays the minimum is 95 cm, if we find bigger, we are happy. For ibex, the size of 140 cm was usual, now hunters enjoy trophy size of 110-120 cm. Nevertheless, we have enough guests.

Guide from the "Dzhura" hunting company, 2016

Based on field observations in Kyrgyzstan and Tajikistan, Rosen (2012:15) suggested that in contrast to trophy hunting, "poaching pressure" highly contributes to the disturbance of the animals, so they flee at the first sign of humans. This is in contrast with what has been noted by Koshkarev (2002) when he visited border zones in 1989, where he describes "plenty of peacefully grazing argali groups" that are not scared by human presence around them. Also, the case in the territory of Kumtor mining where access to the area is strictly controlled, hunting is not permissible, argali are tolerant to humans and other disturbances such as transport logistics related to mining (Rosen, 2012:15). During my fieldwork in 2016 I was able to come close to a distance of 10-20 meters. However, in the hunting company of "Dzhura" of Yssyk-Köl oblast, it was reported that over the period 1998 to 2015, year by year, the average argali trophy shooting distance increased from 300 to 500 metres with a shoot success of 80%, which demonstrates a sign of high hunting pressure and disturbance.

Nevertheless, many international organisations for wildlife conservation including external actors strongly believe that poaching will always take place while locals have little interest in wildlife protection. The financial benefits that come from trophy hunting are considered an effective tool to change human attitudes toward wildlife conservation (Nawaz et al. 2016:221). Therefore, many international NGOs are working on the engagement of the local population in wildlife management in Kyrgyzstan.

4.5.2 Illegal wildlife hunting and trade

Pastoralism is often taking place within the same areas of the landscape that wildlife species occur. Livestock grazing in such areas out compete or displace wild ungulates. In addition to the trophy hunting, high rates of poaching leads to the decline of argali and ibex population, which in turn results in a negative effect on the food base of snow leopards (Jumabay-Uulu et al. 2013:6) and other wild predators including wolves. Moreover, the decline in some wild prey species forces wolves and snow leopards to kill livestock for their survival (Holt et al. 2018:98).

> People say that wolves are increased in population. Wolves are not increased… their natural prey decreased. Therefore, they are entering villages.
>
> Zholdoshbek Chungulov, NABU representative in Kyrgyzstan, 2017

The argali and ibex population in Kyrgyzstan has always been subjected to pressure by humans. Despite official protection, wild ungulates were hunted year-round. It is very difficult to exercise control over the shepherds living in highland pastures, especially those who have settled some distance from the main road. Fedosenko (2000:158) found evidence of shot argali in Kainar canyon of Kakshaal Mountain in 1978 and 1979. The 37 skins and 36 pair of argali horns were collected by researchers in chaban's stable. In addition, military servicemen and various expeditions were shooting argali. Within the 1979-1981 period 23 cases of illegal hunting were recorded. Only behind the border fence, the argali population was in relative safety. As well as nowadays poaching rates are high.

The State Agency on Environmental Protection and Forestry (2019) reports that, the main threat to the wild ungulate population comes from poaching. Annually up to 80 nonregistered rifles are confiscated by request of the agency and around 700 protocols on wildlife poaching are filed and directed to enforcement bodies to issue penalties. However, under Article 33 of the Law "About Hunting and Hunting Economy", 30% of the generated value of the claims is paid as an award to the inspectors and rangers who registered the poaching case.

The Department of Protection and Use of Natural Resources (before 15.12.2016 it was the Hunting Department) of the State Agency on Environmental Protection and Forestry, as well as the Association of Hunters and Fishermen of Kyrgyzstan argue that hunting should be considered separately from poaching. Therefore, to better understand the impact of trophy hunting activity on the wild ungulates population it is necessary to first distinguish the type and scale of trophy hunting that is practiced in the country.

According to the Law “About Hunting and Hunting Economy” of the Kyrgyz Republic, hunting is the process of search, activity of chasing, tracking or trapping for the harvest purpose of free-ranging wild animals. Specifically, trophy hunting, is a form of hunting with the goal to obtain the wild animal’s carcass or body specific part such as horn, skin or tusk as a trophy as the sign of a successful hunt (International Fund for Animal Welfare, 2016:6). In addition, trophy hunting is legal, the quantity of harvest is limited and for high price, and the process is overseen by authorised institutions.

The annual illegal wildlife trade is estimated by UNEP-INTERPOL assessment to be around 23 billion US dollars and makes this crime the fourth largest crime after narcotics trafficking, weapon trading and people trafficking (Nellemann et al. 2016:7). Because the illegal trade in wildlife crosses borders between countries (Fig. 4.10), the effort to regulate it requires international cooperation to safeguard certain species from over-exploitation.

Figure 4.10 The pelt of snow leopard seized by the Custom Service of Germany, Bonn
Photograph: M. Anarbaev, 2015

In accordance with data obtained from the State Agency on Environmental Protection and Forestry, up to 700 international hunters from over the world, visit Kyrgyzstan annually. For instance, in 2019, the country officially accepted 507 international trophy hunters and most of them came from EU member states and the USA (Fig. 4.11). According to publication of the International Fund for Animal Welfare (2016:25) Kyrgyzstan is listed among the Top 20 trophy exporting countries around the world between 2004 and 2014. In the list of Top 20 importing

countries leadership position belongs to USA and European countries, 70% and 20% respectively (International Fund for Animal Welfare, 2016:24). And it is not surprisingly in the trophy hunting market of Kyrgyzstan that hunters from the USA constitute a prominent share. However, the share of European clients is also quite dominant.

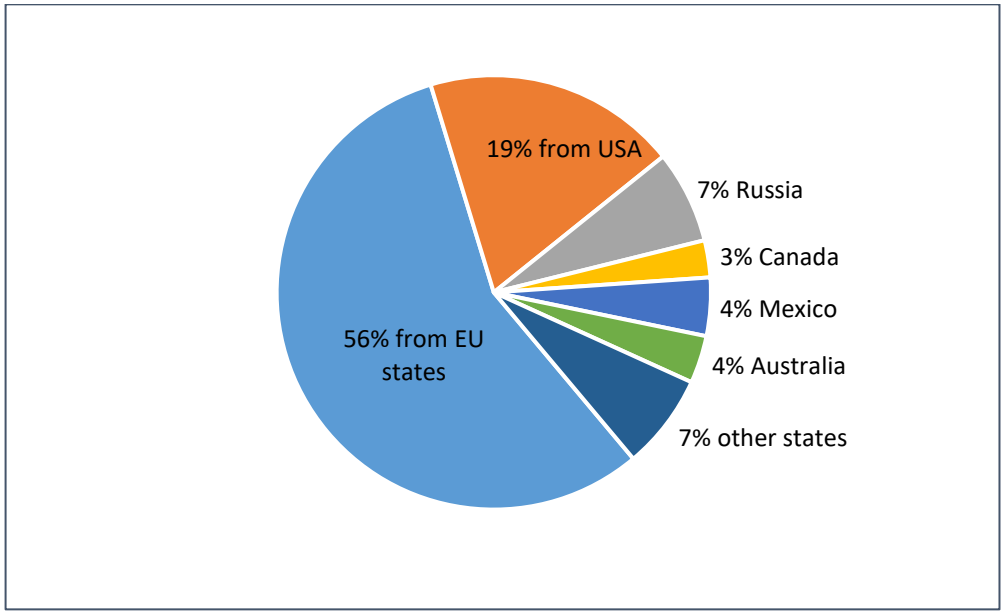

Figure 4.11 The share of International Trophy Hunters visited Kyrgyzstan in 2019 by countries
Source: Compilation based on unpublished report of the State Agency on Environmental Protection and Forestry (2019)

The actual number of foreign trophy hunters exceeds allocated hunting limits. Almost there is no report that a hunter went home without a trophy. For example, according to Sievers (2003:172) in 1996, the limit for Marco Polo sheep was eighteen head, even in that time American hunters were importing much more argali trophies than the national laws of Kyrgyzstan permitted by hunting. These facts demonstrates that the harvest rate is at least two-times higher than the permissible harvest limit and poses a significant concern to wildlife conservationists on the hidden part of trophy hunting. Therefore, public concerns and petitions of environmental NGOs about illegal wildlife trade, poaching and overharvesting are regularly taking place in Kyrgyzstan.

According to the Law “About Hunting and Hunting Economy” (2014), the decision on limits and quotas are identified by a Commission, which is established by Decree (Rus: *prikaz,* Kyr. *buiruk*) of the State Agency on Environmental Protection and Forestry. The Commission is established for three years and consists of at least of five members (Fig. 4.12), including two officers from state agency itself, one specialist from the National Academy of Science of the Kyrgyz Republic,

one representative from the Association of Hunters and Fishermen, and one member from a local NGO working on environmental issues in the republic.

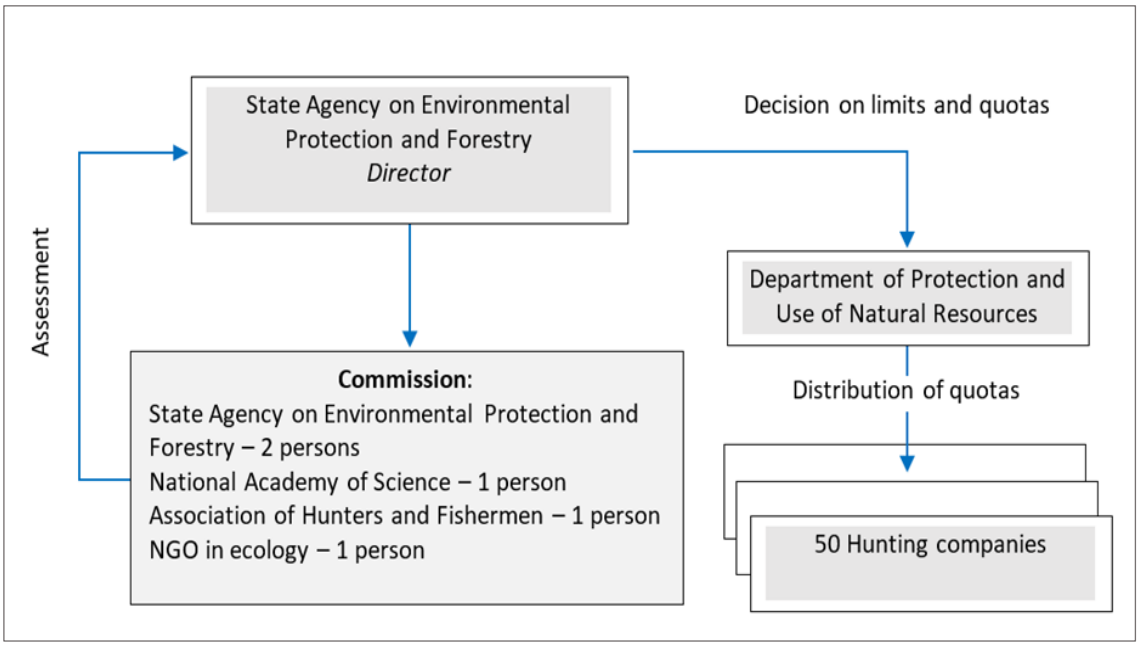

Figure 4.12 Decision making process on hunting limits and quotas
Source: Compilation based on the Law "About Hunting and Hunting Economy", 2014

Based on a decision of the Commission, the State agency makes the Decree on hunting limits and allocates quotas for hunting companies. This scheme was developed after many discussions and criticisms to the State agency.

It is assumed that the involvement of other stakeholders will make the decision-making process transparent. However, the limits are not reducing the problem of over-hunting. Therefore, to solve illegal trophy hunting, or in other words illegal export of trophies, it is necessary to pay attention to the export procedure. The process of issuing export documents for trophies should be more transparent as well as a cross check with the provisions under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (Box 4.3).

Therefore, in terms of the further improvement of the legislation in the field of permit issuance, there should be cooperation with custom and border services and international organisations should consider strengthening the role of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in the country.

Box 4.3 CITES

The Convention on International Trade in Endangered Species of Wild Fauna and Flora also known as the Washington Convention was drafted as a result of a resolution adopted in 1963 at

a meeting of members of IUCN and opened for signature in 1973, and on 1 July 1975 CITES entered in force. The Convention regulates export, re-export and import of flora and fauna through a system of permits and certificates.

Thousands of species are internationally traded and used by people in their daily lives for food, housing, health care, ecotourism, cosmetics or fashion. CITES regulates international trade in over 35,000 species of plants and animals, including their products and derivatives, ensuring their survival in the wild with benefits for the livelihoods of local people and the global environment. The species covered by CITES are listed in three Appendices, according to the degree of protection they need.

Appendix I - includes species threatened with extinction or can be affected by trade. Trade of these species is permitted only in exceptional circumstances.

Appendix II - includes species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilisation incompatible with their survival.

Appendix III - contains species that are protected in at least one country, which has asked other CITES Parties for assistance in controlling the trade.

The CITES permit system seeks to ensure that international trade in a listed species is sustainable, legal and traceable. The CITES Secretariat is administered by UNEP and is located at Geneva, Switzerland (see https://cites.org).

Kyrgyzstan as an independent state became a Party to CITES in 2007, however since 1976 it was in contact with the Russian Federation Party to CITES as part of the former Soviet Union. CITES works by subjecting international trade in specimens of selected species to certain controls. All import, export, re-export[89] and introduction[90] of species covered by the Convention has to be authorised through the licensing system. According to Article IX of the Convention, Management and Scientific Authorities, each Party to the Convention must designate one or more Management Authorities in charge of administering the licensing system and one or more Scientific Authorities to advise them on the effects of trade on the status of CITES listed species. In Kyrgyzstan, the State Agency of Environmental Protection and Forestry, defined by Government as the Management Authority and National Academy of Science, acts as the

[89] Re-export – export of specimen or trophy that was imported previously from another country. For instance, there are many cases when the Marco Polo sheep trophies originally from Tajikistan re-exported to other country from Kyrgyzstan, causing discussions about overharvesting and corruption.
[90] Introduction of species to new habitats.

Scientific Authority. Previously this status and function to regulate limits for trophy hunting was under the power of the Ministry of Agriculture.

According to the German Society for International Cooperation (GIZ), the Federal Agency for Nature Conservation as the German CITES Management Authority took part in a fact-finding mission to Bishkek in 2012. The mission aimed to increase the effectiveness and improve the implementation and enforcement of CITES in Kyrgyzstan. However, by 2013 no seizures of CITES specimens have been made at any point on the Kyrgyz border since the country became a Party to the Convention in 2007 (Vaisman et al. 2013:42). However, in 2017 the skin and horns of argali and ibex were seized at the Bordöbö border checkpoint in the Alai Valley. A smuggler, on route from Tajikistan to Kyrgyzstan brought by car seven argali and four ibex illegal trophies (Kabar, 2017).

Generally, argali species are included on CITES's Appendix II. Except the subspecies Kara-Tau argali (*Ovis a. nigrimontana*) which inhabits in Kazakhstan and Tibetan argali (*Ovis a. hodgsonii)*, which are included on Appendix I. The United States Endangered Species Act (1973) lists argali as "Endangered", except in Mongolia, Kyrgyzstan, and Tajikistan, where they are listed as "Threatened". Permits for importation of trophies are generally not authorised for taxa listed as "Endangered". Therefore, the "Threatened" classification allows for importation of trophies from legally taken argali in those countries under specifically authorised permits from the United States Fish and Wildlife Service (Harris and Reading, 2008).

In the Central Asian region, the cheapest price for argali hunting is in Kyrgyzstan. For this reason, it attracts many clients from over the world. For instance, the lowest price offered by the USA based company (www.legendsoutfitting.com) for argali hunting in Mongolia may vary from 44 to 70 thousand USD, while companies from Kyrgyzstan are offering half of this price.

Often, clients, in addition to argali, also hunt ibex, as there is no need to change hunting camp and place. This may cost less than a separate tour specifically for ibex, as far as the hunter is already there.

Decrease of wild ungulates populations in Kyrgyzstan is a sensitive topic, which creates many discussions in society and it is associated with trophy hunting (Nordbø et al. 2017). A hunting ban on some game species is actively facilitated by several local NGOs such as "Green Alliance of Kyrgyzstan", "BIOM" and "Green Kyrgyzstan". They collected over 8,000 signatures within seven months and together with group of lawmakers in the Parliament proposed a hunting moratorium

for 2020-2030 for argali, ibex, red deer[91], and wild boar. However the Kyrgyz Government disagreed and opposed the draft Law[92]. On 23 October 2019, the Kyrgyz Parliament rejected a bill banning the hunting of certain species of animals. It was the fourth attempt to obtain a moratorium on hunting.

> We have only 203 rangers for entire country. There are many illegal rifles on hands of locals that remains from kolkhozes and sovkhozes. Nowadays hunting companies take care of game species, because this is their future income. Nobody among trophy hunters wants to hunt illegally
>
> Almaz Musaev, Director of the Department of Protection and Use of Natural Resources, State Agency on Environmental Protection and Forestry, 2017

Game-biologists also do not agree with a ban on trophy hunting and strongly agree that a moratorium will not benefit the game species at all. It is argued that, nowadays, the hunting companies are protecting them for their clients, so there is no economical meaning to protection. Wildlife management officers from the Department of Protection and Use of Natural Resources under the State Agency on Environmental Protection and Forestry, emphasise that some NGOs use the media and social network to mislead and confuse people within the poaching and trophy hunting fraternity. While trophy hunting is a legal and paid service, which considers limited harvest of permitted game species.

Nowadays human-wildlife conflict due to damage caused by wild predators, such as livestock depredation, became one of the intense and most widespread issues in wildlife management in Kyrgyzstan. It occurs not only because of the overlap of habitats, decrease of natural prey, conservation status of certain species, but also because wildlife management involves many actors with diverse views and decisions about wildlife (Marchini, 2014:190).

The use of natural resources such as pastures and wildlife as well as priorities for animal husbandry, and the agenda for nature conservation in the form of Protected Areas, were changed over time in post-socialist Kyrgyzstan. In comparison to the Soviet times, use of wildlife resources involves many interested parties, and the sphere of human-wildlife interrelationship is shaped by many factors. The global environmental agenda facilitated by many powerful and leading actors has great influence. Becoming a Party to the several conventions, realisation of various projects funded by external donor organisations, implementation of obligations for wildlife

[91] Red deer is not the game species in Kyrgyzstan, but it was included into Law draft by initiators.

[92] Government Decree No. 271 on 3 June 2019 “About the Conclusion of the Government of the Kyrgyz Republic on the Draft Law of the Kyrgyz Republic on the Prohibition of Hunting for Certain Wildlife Species in the Kyrgyz Republic". See http://cbd.minjust.gov.kg/

conservation all together substantially raise the profile of wildlife management in Kyrgyzstan at the international level. However, in many cases the voice or points of view of pastoralists who live in close contact with the wildlife or share the same landscapes are often forgotten. Therefore, to better understand human-wildlife interrelationship it is necessary to look at the concerns and challenges for pastoralists as well.

5 Source of income – Kyrgyzstan and Kashka-Suu aimak compared

5.1 A brief introduction to the case study site

Within the Alai Valley the Kashka-Suu aimak has been chosen as the case study site (Fig. 5.1). Administratively, it is a municipality which belongs to the Chong-Alai rayon of Osh oblast. The local municipality is governed by an executive body *Aiyl Ökmötü* under the regulation of a local representative body, the *Aiyl Kengesh*. The improved public health care system and resettlement of people from other parts of the Soviet Union during various times have contributed to the population growth in Kyrgyzstan. The national population increased from one million people in 1926 (Abazov, 2004:4) to 6.3 million at the end of 2018 (NatStatCom, 2019). However, the Chong-Alai rayon with its center in Daroot-Korgon is the most sparsely populated region of the Osh oblast, with the population density of 4.9 persons per km^2, while the average density of the oblast is 43 persons per km^2 (NatStatCom, 2016b:6).

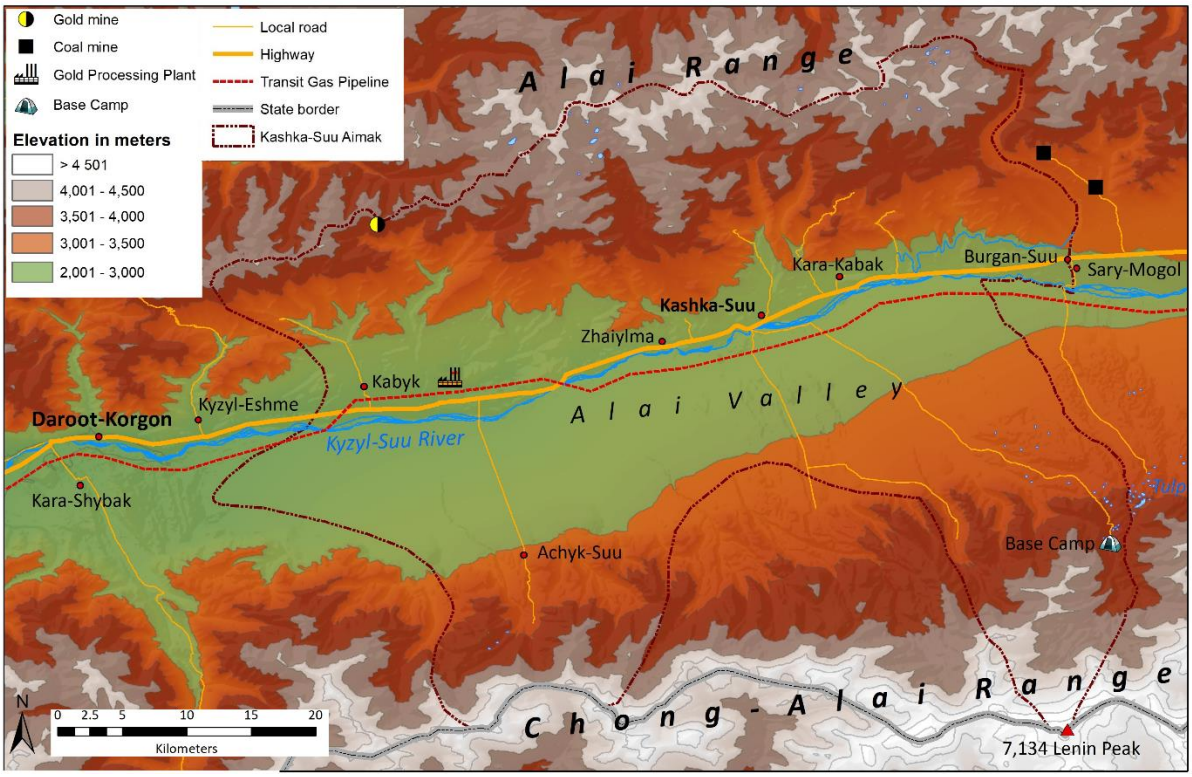

Figure 5.1 Location of the case study site – Kashka-Suu aimak in the Alai Valley
Source: Based on topographic map of Kyrgyzstan (2006), own field survey (2015 and 2018) and Shuttle Radar Topography Mission (SRTM) elevation data. *Cartography:* M. Anarbaev

Under the administration of the municipality, there are six settlements including the Kashka-Suu as administrative center, and Kara-Kabak, Achyk-Suu, Kabyk, Zhaiylma and Burgan-Suu, which make it the largest aimak of the Chong-Alai rayon. Villages are comparatively small, located on the right and left bank alongside of the Kyzyl-Suu River.

Historically, the Alai Valley has been associated with animal husbandry, especially sheep and yak breeding. However the history of Kashka-Suu aimak linked with the Green Station, locally known as Zelenstan (Rus. *Zelyonaya Stantsiya*) established in 1932, where various vegetables and crops were tested in the mountain climate to select suitable crop varieties and plots for cultivation (Fig. 5.2). Later it was reorganised into the Experimental Station YUKOS (Rus. *Yuzhno-Kirgizskaya Opytnaya Stantsiya* – the South-Kyrgyzian Experimental Station) in the Kara-Kabak village formerly known as Kyzyl-Döng.

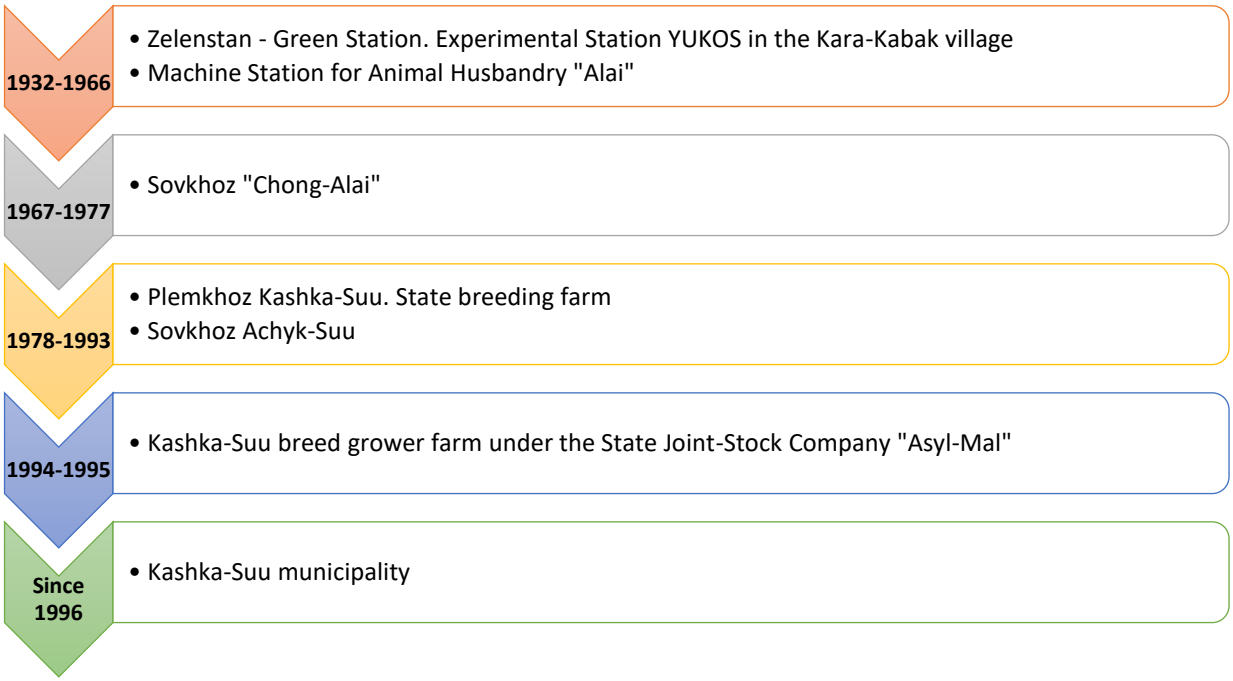

Figure 5.2 Organisational developments within the Kashka-Suu aimak
Source: Based on own field survey in 2015

In 1967 together with the Alai Machine-Station for Animal Husbandry (Rus. *Mashinno-Zhivotnovodcheskaya Stantsiya*)[93] it was incorporated within the sovkhoz "Chong-Alai" that was established in Kashka-Suu village.

Early 1990s, with the aim of further implementation of land and agrarian reform, the Government of Kyrgyzstan has attempted to preserve the gene pool of animals of the breeding farms, through a unified policy on animal selection and breeding. In 1994, the Kashka-Suu breeding farm (Rus. *Plemkhoz*), together with many other farms in the republic, was integrated into the State Joint-Stock Company *Asyl-Mal* (in Kyrgyz language means thoroughbred livestock).

[93] In the Soviet era the Machine Stations for Animal Husbandry were established and subsidised by the state for the mechanisation of labour-intensive works in animal husbandry. These stations performed works for collective farms on hay harvesting, silage of fodder, watering of pastures, electric shearing of sheep and transportation.

However, because of the dissolution of collective and state farms, in 1996 it was organised as the local municipality, within the boundaries of the former sovkhoz Chong-Alai, the breeding farm of Kashka-Suu, sovkhoz Achyk-Suu and the Alai Machine Station for Animal Husbandry in the Kabyk village.

In the territory of the aimak there are five secondary schools, two kindergartens and one small clinic (Rus: *FAP – Feldshersko-Akushersky Punkt*) that provides basic medical services.

According to unpublished data of the Kashka-Suu municipality (2020), in 2019, the total population of the aimak was about 9,181 people or 2,113 households. The villages of Kashka-Suu and Achyk-Suu are the biggest settlements within the aimak (Fig. 5.3). The population of Kashka-Suu village increased rapidly in 2015 due to the number of formally registered young families who were promised an allocation of land in the territory of the village, but later this initiative was not realised. Because local parliament did not adopt a decision on land transfer for construction. The three villages of Kara-Kabak, Zhaiylma and Kabyk are almost equal in population size. The smallest village, Burgan-Suu, was integrated into the Kashka-Suu municipality in 2002 when land that was formerly leased to Tajikistan around Sary-Mogol came under the jurisdiction of Kyrgyzstan.

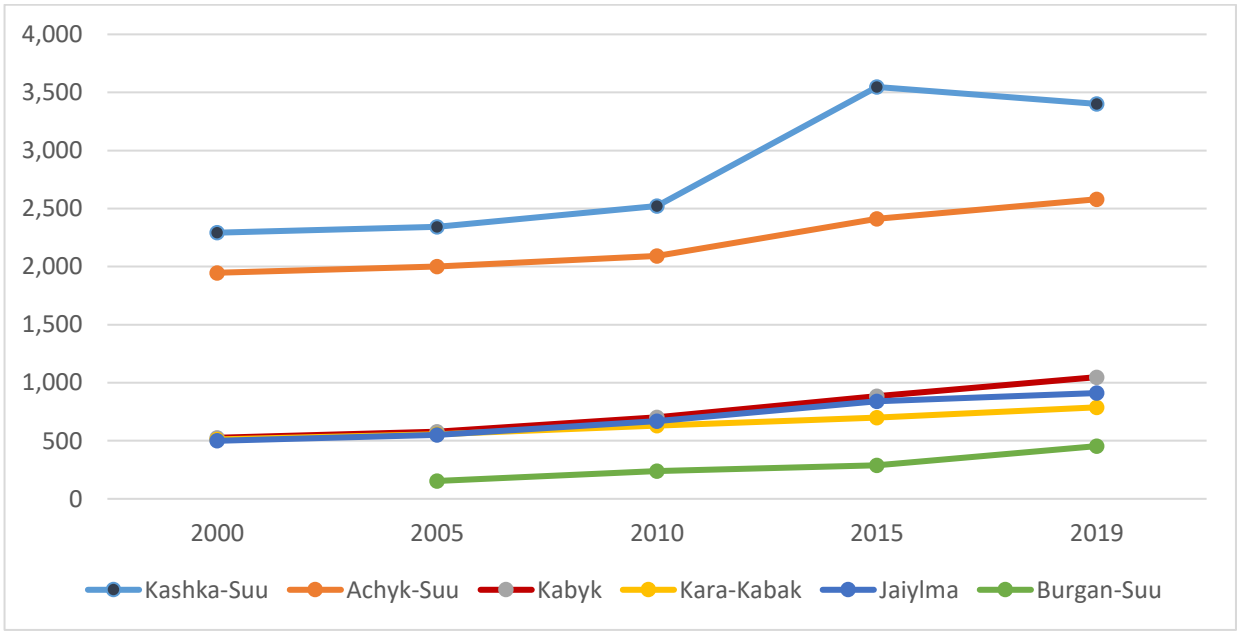

Figure 5.3 Demography dynamics in the Kashka-Suu aimak
Source: Data provided by the Kashka-Suu municipality, 2015 and 2020

The Sary-Mogol River was defined as the administrative border between Kashka-Suu and the newly established Sary-Mogol municipalities. Therefore, the small settlement on the right bank of the river joined with Kashka-Suu aimak.

Traditionally in the Alai Valley, the *Ichkilik* kinship group were the predominant inhabitants (Box 5.1). In the past, an administrative unit had the same name, so the present Chong-Alai rayon became part of *Ichkilik volost*[94]. The Ichkilik kinship group includes clans such as *Teiit*, *Naiman*, *Kypchak*, *Kandy*, *Avat*, *Kesek*, *Zhookesek*, *Boston, Kydyrshaa, Töölös* and *Noigut*. Other clans living in Pamir-Alai, such as *Zhoru* and *Börü*, belong to the *Adygene* kinship group. The Kyrgyz population living in the Zhergetal and Murgab rayons of Tajikistan, as well as the Kyrgyz of the Afghan Pamirs are also represented by the Ichkilik kinship group, giving it many social connections with the Alai region.

Box 5.1 Kyrgyz kinship groups

The kinship group, locally called as *Uruu,* constitutes from several smaller clan *Uruk*, which share common ancestors in the male line, so called "Seven fathers in generation" - *Zheti ata*. The *Sanzhyra* is the historical ancestry tree, data on origin, creation and distribution of the Kyrgyz people. The Kyrgyz kinship groups are divided into three branches known as the *Sol kanat* - Left wing, *Ong kanat* - Right wing and *Ichkilik* in the middle. The word *ichki* – literally means inner.

The kinship group identity remains an important element in Kyrgyz society, for instance the names of many of them are associated with wildlife species. For instance, kinship group of *Bugu* (red deer), *Bagysh* (elk), *Chong-Bagysh* (great elk), *Sary-Bagysh* (yellow elk), *Börü* (wolf), *Zhoru* (vulture), *Adygene* (bear or verbatim mother bear) and others. They were perceived as protectors and spiritual animals, accordingly and harming them was forbidden. Interestingly, the elk (*Alces alces*) or moose do not inhabit in Kyrgyzstan and the closest habitat area is the Altai Mountains (Baskin, 2009).

In contrast to other parts of Osh oblast, the Alai Valley was represented by only state farms and experienced the better provision of so called "Moskow supply" and direct subsidies in agriculture, construction of roads and power grids. It became more tangible during the political confrontation of the Soviet Union and China. However, after the dissolution of the Soviet Union the difficult socio-economic situation that the country faced led to radical reform in the agricultural sector. In 1991 Kyrgyzstan embarked on the privatisation of agricultural land and assets from the state and collective farms, including agricultural equipment, machinery and various buildings that were subject to privatisation as well (Fig. 5.4 and 5.5). As a result of the privatisation program, by 1996

[94] *Volost* was lowest administrative division that abolished after reforms in 1926-1929, which is modern equivalent of *rayon.* Several *volost* made up *kanton*. The use of rayon and oblast as an administrative unit started since 1940 (Dzhunushaliev, 2003:52-53).

the Kyrgyz Government dissolved 275 sovkhozes, 195 kolkhozes and 8 agricultural state enterprises (Abdurashitov, 2015:79).

Figure 5.4 Former garage "Avtotraktorduk Park" of the Kashka-Suu sovkhoz
Auto transport, tractors, combines and other machinery were privatised. Nowadays the garage is still operating but not at the same level as before
Photograph: M. Anarbaev, 2015

Figure 5.5 Former Auto and Machinery Repair Shop of the Kashka-Suu sovkhoz
On the wall it is written a slogan of that time "KPSSke Dangk" – Glory to the CPSU (the Communist Party of the Soviet Union)
Photograph: M. Anarbaev, 2015

Nowadays there are 440,050 private farming entities in agriculture, and for the country which has about 66% population living in rural areas, agriculture still plays an essential role contributing around 15% of the republic's GDP (NatStatCom, 2019:28). For the Kashka-Suu aimak, agriculture is even more crucial and generates almost 85% of its economic output (unpublished data of the Kashka-Suu AÖ, 2018).

During the period 1991-1998, significant intervention took place, and the Kyrgyz Government implemented a three phased wide-ranging privatisation program of state-owned properties. The large-scale mass privatisation started in 1994 and was implemented by example of the Czechoslovakia. The enterprises which are under privatisation issued coupons and distributed them to the workers who then became shareholders. The process of dissolution of kolkhozes and sovkhozes and privatisation of their assets was already under way, starting in 1990. These phases are visible in the diagram of livestock numbers of Osh oblast (Fig. 5.6). Livestock privatisation can be distinguished in three phases, the first was between 1990-1991, the second between 1991-1993, and the final phase was finished by 1996. A dominant proportion of state-owned livestock was privatised, leading to an increase of private livestock ownership. From 1995 onwards there is a rather stable level of privately owned livestock, while livestock numbers under state ownership ceased almost to exist.

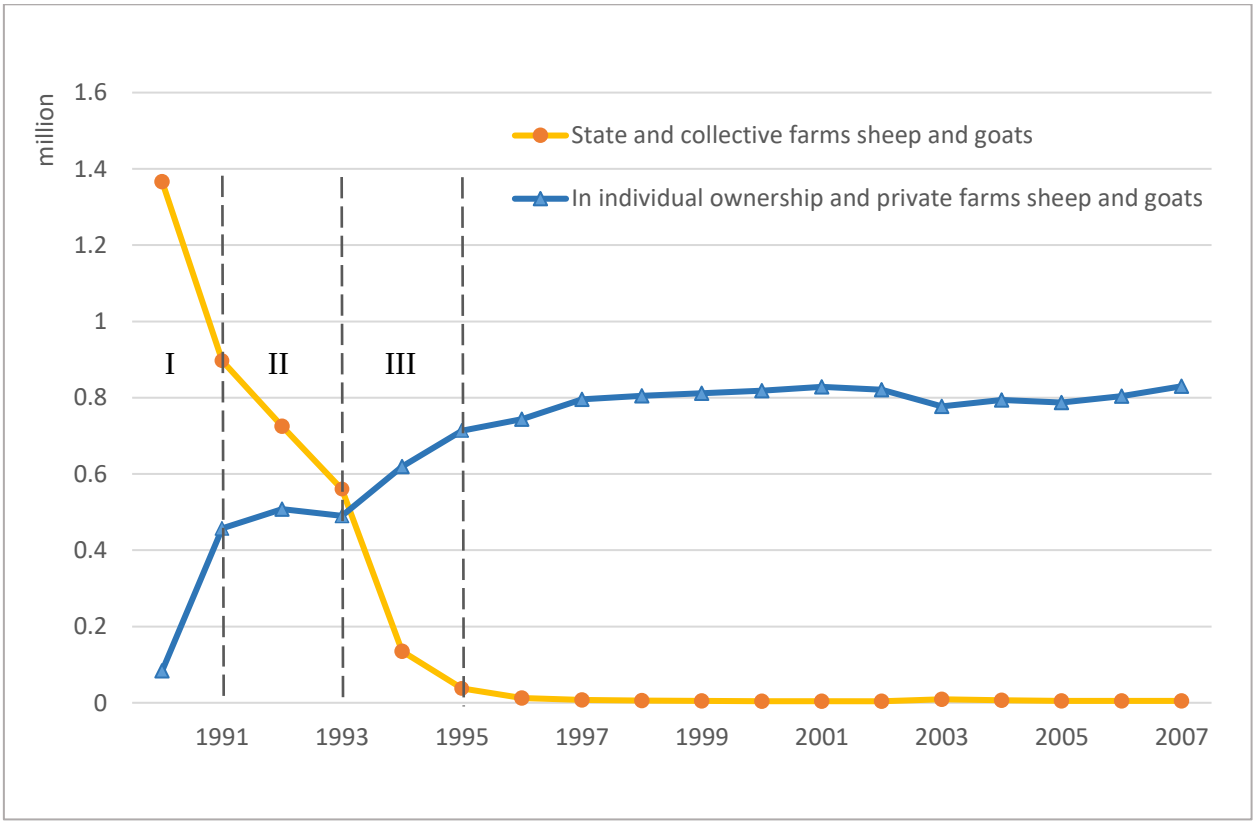

Figure 5.6 The numbers of sheep and goats during privatisation in different farm categories of Osh oblast
Source: Compilation based on NatStatCom, 2008:9 [1990-2007]

Alongside the livestock privatisation, the reform process also included agricultural land management, ownership and land use. Generally, agricultural land is classified as pasture (Kyr. *zhaiyt*), arable land (Kyr. *aidoo zher*) and hayfield, which includes natural meadows and irrigated grassland (Kyr. *chabyk zher*) (Table 5.1). Arable land, depending on the availability of irrigation, it is divided into irrigated and rainfed (Kyr. *sugat* and *kairak zher*, respectively). By 1999, 75% of arable land was equally distributed among residents of the former collective or state farms and is referred to as *ülüsh zher*[95]. The size of land plots distributed for private ownership depended upon population density and total arable land resources of former kolkhoz or sovkhoz. Accordingly, larger households received more land than small families. Therefore, there are considerable disparities in size of land ownership throughout Kyrgyzstan (Steimann, 2011:82). For instance, people of Kashka-Suu aimak received 0.65 hectare per household member. This made an average arable landholding of 2.47 ha per household. In addition, every house has a small plot of land - home gardens of around 0.15-0.20 hectare, more often called in Russian *ogorod*[96] or in Kyrgyz language *tam arka*, which is as a rule are used for growing fodder crops or gardening.

Table 5.1 Land resources of the Kashka-Suu aimak

Type of land	Rainfed	Home gardens	Hayfield	Shrubland	Irrigated	Pasture
Area, in hectare	35	190	335	2,390	4,187	85,735

Source: Data provided by the Kashka-Suu municipality, 2018

Shrubland areas are located along the riverbanks and represented mainly by sea buckthorn, willow and needlegrass species (*Achnatherum*). Some amount of the sea buckthorn's orange-yellow berries is collected by locals for jam making. The needlegrass locally called *chii* is used for making mats, which is an important component of the traditional yurta's interior.

Agriculture plays a crucial role in the republic and provides the largest share of employment. From a total labour force of 2.5 million people, around 700 thousand people are engaged in agriculture which is about 30% of the total employment of the country. In the Alai Valley, about 75% of employed people are engaged in the agricultural, hunting and forestry sectors. The civil service and education sector provide up to 15% of jobs, and the rest is provided by mining and sphere of service (NatStatCom, 2016a:19). As well as in Kashka-Suu aimak, pastoralism is the

[95] Kyr. *Ülüsh* means the share or portion. During the distribution of land, people received their "share" of land in accordance with the number of family members. Since then, arable private land remains under this name.

[96] The correct spelling is *ogorod*, while pronounced as *agarod*, therefore some use it in this form like in Shirasaka et al. (2013:93).

most important livelihood, which provides almost 42% of the total cash income source of households (Table 5.2).

Within the Soviet budget, Kyrgyzstan had been formerly directly and indirectly subsidised, which ranged around of 20% of the GDP. Later, from 1992, direct free transfers vanished, and the country was challenged with a budget deficit equal to two times less than what it had been before (Akaev, 2000:51). The socio-economic situation became difficult especially in rural areas.

Table 5.2 Main cash income sources of households in the Kashka-Suu aimak

Cash income-generating activity and source	%
Pastoralism (meat, dairy products, wool, livestock skin)	42
Social payments (retirement pension, social allowance for child, disability, veteran etc.)	26
Crop cultivation (potato and fodder crops)	11
Salaried job (teachers, herders, state and municipal workers)	10
Remittance	6
Service (trading, tourism, transportation, tractor services)	5

Source: Based on own field survey in 2015-2018 and personal communication with the Social Protection Specialist of the Kashka-Suu municipality, 2020

In 2019, the official poverty line in Kyrgyzstan was defined as an annual income of 32,981 KGS per capita, which is around 34 USD per month. Accordingly, about 20.1% of the population live below the national poverty line, and from them 73.8% is rural population (NatStatCom, 2020). In Kashka-Suu aimak the poverty level is higher than the national level, and in 2019 it was estimated as 32%, which is 675 households. For many households, the social support system is an important source of cash income, where 26% of all households receive cash income from various types of social support services such as retirement pension, and supplementary allowance for labour and war veterans. In addition, government provides the state allowance (Box. 5.2) for certain household categories. Every local municipality in its structure has an officer for social protection who makes records and determines eligible families for the state allowance (Rus. *Gosudartsvennoe posobie*).

Box 5.2 State allowance

According to the Law “About State Allowance in the Kyrgyz Republic” (2017), the social support system of Kyrgyzstan provides basic social guarantees. By 2020 there are four types of state allowance:

- monthly allowance for needy families with the children under 16 years old, termed as “üi-bülögö kömök” - support for family. The amount of allowance is determined according to the Guaranteed Minimum Income which is 810 KGS (10 USD) per child.

- monthly child allowance if both parents are unknown (2,000 KGS).
- monthly “social allowance” for orphans, citizens with disability, mothers with seven and more children, citizens who have no retirement pension (3,030 KGS). The social allowance is assigned regardless of family income.
- one-time payment at the birth of each child - "balaga süiünchü" (4,000 KGS).

The state allowance “üi-bülögö kömök” for needy families is not paid if a citizen has owned auto-transport (tractor, combine, truck, minibus or car less than twenty years since manufacture with the engine capacity of two or more liters) in working condition. Another requirement is the number of livestock, which should be no more than four heads of sheep units per family member. For the calculation purpose, other domestic animals are converted into the conditional livestock units. It currently uses the estimation of one calf is equal to 2.5 sheep, one heifer to four sheep, one cattle (cow, yak and ox) to six sheep, one horse to seven sheep and one bull to eight sheep. For example, the family consisting of five members which has no auto-transport and holds one cow with two calves is eligible for the state allowance for needy families, (6+2.5+2.5)/5 persons=2.2 sheep units.

Moreover, the Law “About the State Guarantees and Compensations for Persons Living and Working in Condition of Highland and Remote Hard-to-Reach Zones” (1996) provides additional support and privileges such as earlier retirement[97]. All six villages of the Kashka-Suu aimak are in the List of Settlements Located in Highland Areas[98] of the Kyrgyz Republic. Therefore, municipal and state employees, and beneficiaries of the social support system receive supplementary payments to their salaries and allowances. For example, according to the adopted Government Decree No. 377 on 25 June 1997 “About the Provision of State Support for Persons Living and Working in Highland and Remote Areas of the Kyrgyz Republic”, the settlements of Kashka-Suu aimak has coefficients for additional payments to salaries and other types of social allowance as following: Kashka-Suu (1.7), Kara-Kabak (1.7), Achyk-Suu (1.8), Kabyk (1.6), Zhaiylma (1.6) and Burgan-Suu (1.7).

Another cash income-generating activity is crop cultivation, which provides cash income for 11% of households, mainly from the harvest of potato. Among the crops, wheat is less popular due to

[97] Retirement age in Kyrgyzstan is 63 and 58 for man and woman respectively. But for the citizens who live and work in the villages located at the highland areas, retirement age is 55 and 50 respectively.

[98] Government Decree No. 55 on 13 February 2007 “About of the List of Settlements, Located in Highland Areas of the Kyrgyz Republic, and the List of Settlements in Remote and Hard-to-Reach Areas of the Kyrgyz Republic”.

the cold weather and short growing season and susceptibility to frost (Shirasaka, et al. 2013). In contrast, sainfoin, alfalfa and barley are widely cultivated for winter forage of livestock.

Potato (*Solanum tuberosum*) cultivation is widely practiced throughout the Alai Valley which provides additional income for many pastoralists. In particular, within the Kabyk village it generates almost the same amount of income as pastoralism.

> The average farm yield for potato is 20-25 tonnes per hectare, with maximal 30 tonnes in 2014. From the harvest 3.5 tonnes are kept as a seed for the next year and around of two tonnes for the self-consumption, the rest is for sale. This year, from the Aiyl Ökmötü we received new seeds of potato called *Jelly*[99] that came from the Yssyk-Köl. It costed 40 KGS per kilogram [0.57 USD]. I have cultivated three tonnes in one hectare of my land. Half hectare is used for sainfoin as an additional forage for my 150 sheep and 20 cows.
>
> Manas Abazbekov (born in 1953), former agronomist of the Alai Machine-Station, Kabyk village, 2015

Within the territory of the aimak, Kabyk village (Fig. 5.7) is a prominent location for potato cultivation. The village was established with the aim of increasing fodder security for the livestock of sovkhozes in the Alai (K. Andarov, personal communication, 2015).

Figure 5.7 The Kabyk village was established in 1976
Houses of the same type and planning were built with help of state subsidies, and have attached livestock shelters to keep livestock
Photograph: M. Anarbaev, 2015

However, the local population of the Kashka-Suu aimak actively started potato cultivation from the early 1970s. Limited arable land was available for forage crops. After the dissolution of state

[99] Jelly is the medium-late variety of potato, developed by the "Europlant" Germany based company. See https://www.europlant.biz/sorten/

farms, potato quickly expanded to all irrigated lands and became common for cultivation (M. Abazbekov, personal communication, 2015). There are some popular varieties under brands such as *Agava* with red flowers, and *Kardinal* which has white flowers. Potato seeds are supplied from the Nookat area of Osh oblast.

Despite the high risk from early frost, which happens from time to time, potato remains a single cash crop in the region. According to respondents, it is believed that due to the cold climate, potatoes in Alai are free from Colorado potato beetle *(Leptinotarsa decemlineata)* and other insects. Locals do not apply chemicals, using only livestock manure as fertiliser. Therefore there is good demand for potato from the region, already well-known under the brand of Alai (Kyr. *Alaidyn kartoshkasy*). The main market for potato is in Osh city, and in addition a small portion goes to the Murgab rayon of GBAO Tajikistan.

The Alai Valley, as a sparsely populated region, provides limited opportunity for salaried jobs in business and the sphere of service. Nevertheless, some activities such as trading, tourism, and transportation services provide cash income for 5% of households in Kashka-Suu aimak. While the remittance is important for the 6% of households. As a rule, teachers, state and municipal employees are referred as the main categories who receive a regular salary. However, herding for others is a popular job, especially for those who own small number of livestock. For instance, a herder with a herd size of 500 sheep earns around of 40,000 KGS (500 USD) per month in fee rates of 2020.

Salaries in the public and municipal sector are low but secured with social guarantees such a retirement pension. According to the Osh Regional Department of State Statistics (2021) an average monthly salary of one employee in Chong-Alai rayon was 16,900 (211 USD) in 2020. It is hard to make a living on a single salaried job for an average household. From the total 2,113 households in Kashka-Suu aimak, only 18 households do not have livestock, which indicates the importance of livestock for the local livelihoods.

According to the economic transformation policy, the Kyrgyz Government followed the course of comprehensive development of private enterprise and stimulation of competition (Akaev, 2000:5). Livestock and arable land were distributed among former farmworkers and other villagers including teachers, civil servants, doctors, and others who by the time of privatisation were working within the territory of the kolkhozes or sovkhozes. Distribution of large numbers of livestock to the hands of rural population was good base for securing their livelihoods and increase of self-employment (Akaev, 2000:31), but demanded new institutional and legal

arrangements in spheres such as pasture use, veterinarian services, market and human-wildlife conflicts.

The Alai Valley, being an outpost of the Soviet Union, received much support, and state subsidies were mainly directed to agriculture. Mechanisation of labour-intensive works and construction of irrigation channels made it possible to expand arable land to some extent but the use of pasture for livestock is a main type of land use. Following the dissolution of state farms and collapse of the socialist economy, rural poverty increased. The turn into the market economy, and the privatisation of agricultural assets, increased the importance of rural livelihood strategies according to the realities of the post-socialist Kyrgyzstan.

5.2 Pastoralism as a main livelihood strategy

> Die Kirgisen haben sechs Arten von “Milchkühen”, nämlich Stuten, Jaks, Kamele, Ziegen, Schafe und wirkliche Kühe
> The Kyrgyz have six types of "dairy cows", namely mares, yaks, camels, goats, sheep and cows
> (Borchers, 1931:39)

Throughout the world, the livelihood of around 200 million people depends on pastoralism. About 25% of the Earth’s terrestrial surface is used for pastoralism and has both economic and cultural value (Linnell and Lescureux, 2015:18).

Historically the Alai Valley is an important geographic corridor and passage of interior Central Asia and was part of the Silk Road network which connected ancient Kashgaria with trading centers in the Fergana Valley. Moreover, recent archaeological surveys discovered that pastoralists utilised the Alai Valley from the early Bronze Age, during the late 3rd millennium BCE (Taylor et al. 2018). Nowadays, environmental, and climatic characteristics of the Alai Valley provide suitable conditions for animal husbandry.

> Since my childhood I am dealing with livestock. Our life is based on pastoralism and livestock is our everything. They give milk, cream, yogurt, meat, wool … They needed in bad and good days [funerals and celebrations]. We use them to pay for higher education of our children.
> Herder, Kashka-Suu village, 2015

For the population of Kashka-Suu aimak, pastoralism is primary livelihood strategy, source of income and wellbeing. A wealthy person is referred to as *kolunda bar* or *malduu-zhanduu adam*, verbatim who has livestock. Moreover, the livestock numbers play a role in the social status in the community as well. The main activities of a typical household in Kashka-Suu

aimak are associated with livestock grazing on pastures, animal care and forage supply for livestock (Table 5.3).

In winter, livestock is kept in the livestock shelters, and they are stall-fed. In this time of the year, because of limited feeding, many livestock lose weight and as a rule they sell for a lower price. In addition, some pastoralists may sell because of difficulties with maintaining sufficient fodder. Many people use this time to buy livestock and from May herds are sent for grazing in summer pastures. In autumn, livestock return from summer pasture in good weight condition and are sold for a better price. Many of them are also sold by September at the start of schooling, to buy necessary goods and clothes, as well to pay tuition fees for higher education.

Table 5.3 Annual work schedule of the pastoralist household in Kashka-Suu aimak

Main activities	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Livestock in the near-village pastures or stall-feeding												
Livestock on the market												
Fieldworks for growing potato and fodder crops												
Livestock in the summer pastures												
Haymaking and fodder procurement												
Procurement of firewood, coal and dung												
Harvest sale												

Source: Based on own field survey in 2015 and 2018

The pasture is the dominant share of available agricultural land of municipality and managed by the Kashka-Suu Pasture Committee. The Pasture Committee prepares a management plan, which includes a grazing plan, improvement of infrastructure in pastures and the pasture use fee rates which should be agreed by the local parliament – Aiyldyk Kengesh.

The pastures of the Alai Valley are divided laterally by the Kyzyl-Suu River. The northern part of the valley, geographically, is called Küngöi, which means sunny side, and the southern part is Teskei[100]. Within Kashka-Suu aimak, summer camps are mainly located in the Teskei part of the Alai Valley, while the livestock shelters are mainly in the Küngöi part of the valley (Fig. 5.8).

[100] The terms Küngöi and Teskei are also used to the sunny and shadow side of the mountains respectively.

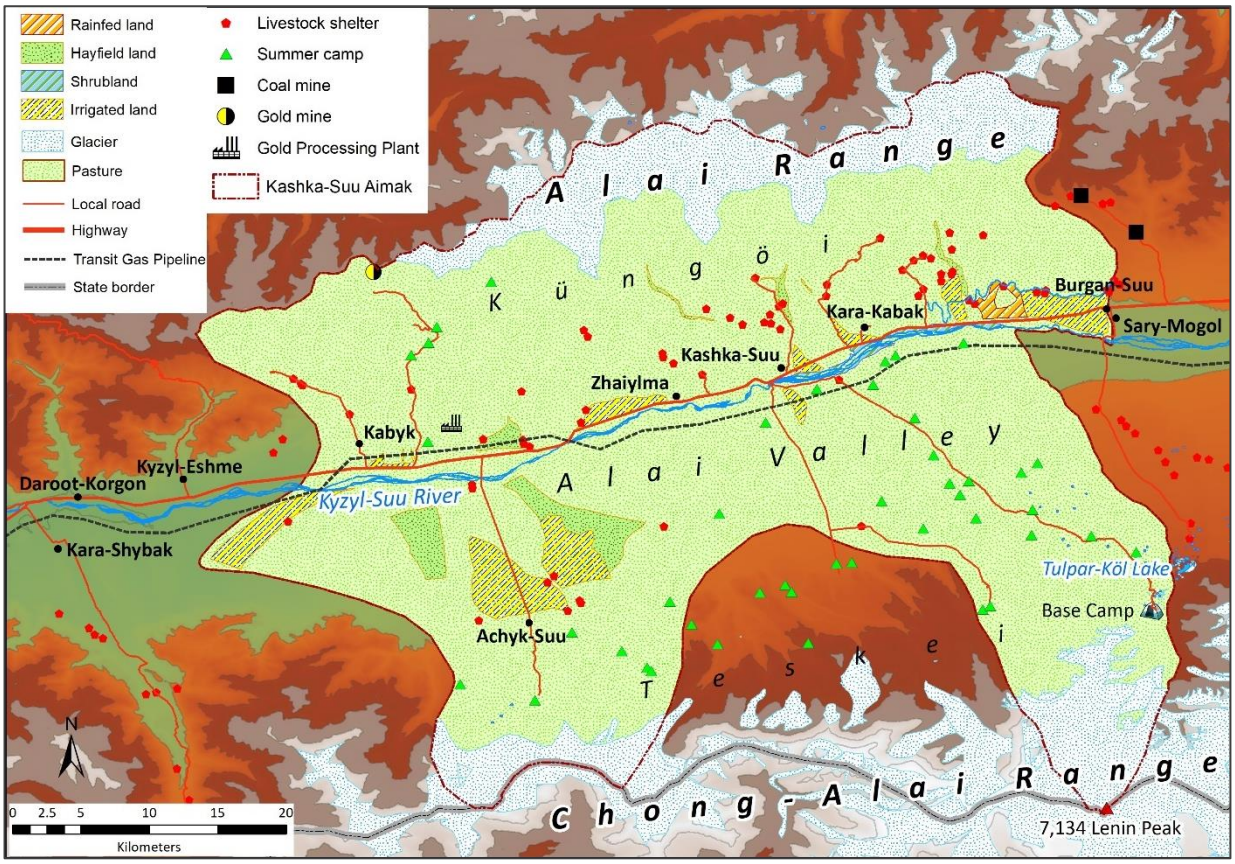

Figure 5.8 Land use in the Kashka-Suu aimak

Source: Based on topographic map of Kyrgyzstan (2006), own field survey in 2015-2018. *Cartography:* M. Anarbaev

The pastoralists in Alai Valley, like in other mountainous parts of Kyrgyzstan, have mixed herds, consisting of sheep and goats, cows, horses, yaks and some camels. In particular, in the Kashka-Suu municipality, the dominant herd composition is sheep and goats (Table 5.4).

In winter of 2012, in the Alai Valley, there was a *zhut* – extreme and long cold weather, which caused a high loss in livestock. The price for hay increased two times and lack of forage was supplemented from other regions of the country. For instance, in Kashka-Suu aimak, livestock numbers had only recovered to the levels of 2010 by 2019.

Table 5.4 Livestock numbers in the Kashka-Suu aimak

	2010	2015	2019	Pasture use fee for locals KGS per head	Pasture use fee for others KGS per head
Sheep and goats	31,845	23,334	31,310	10	50
Cattle	3,812	3,303	4,870	50	250
Horse	1732	869	1,900	70	350
Donkey	337	262	297	free	free
Camel	6	4	1	70	350

Source: Data provided by the Kashka-Suu Pasture Committee, 2010; 2015 and 2020

In addition, for the summer pastures, there are around 20,000 sheep and goats that arrive from the lowland rayons of Batken oblast. However, they pay a five times higher fee for the use of pasture in comparison to the locals.

Interestingly, in recent years, donkeys have started to be included into the statistics of livestock numbers. Traditionally, donkey is not a riding animal in Kyrgyzstan, being used principally as a draught or pack animal. For instance, in 2014 the price for one good donkey was 1,000 KGS (14 USD). However, since 2015 due to high demand from China, the price of donkey has increased up to 100 USD or the equivalent of one sheep. But due to its local image as not serious domestic animal, or a cheap animal, the Pasture Committee does not require payment for pasture use from the owner.

In Kyrgyzstan, there are two types of seasonal movement of livestock for summer pastures (Fig. 5.9). The first type of seasonal movement can be classified as vertical or 'ascending' (Shirasaka et al. 2013:82). This form of pasture use is widely practiced throughout the country. Livestock herds from the lowland area settlements are brought to the summer pastures at a higher altitude. The distance is usually from 15 to 150 kilometres and by autumn livestock are driven back to the winter quarters. The second type of seasonal movement of livestock is practiced in the Alai Valley. Here, livestock are driven within the valley for a distance of up to 50 kilometres, without big differences at altitude.

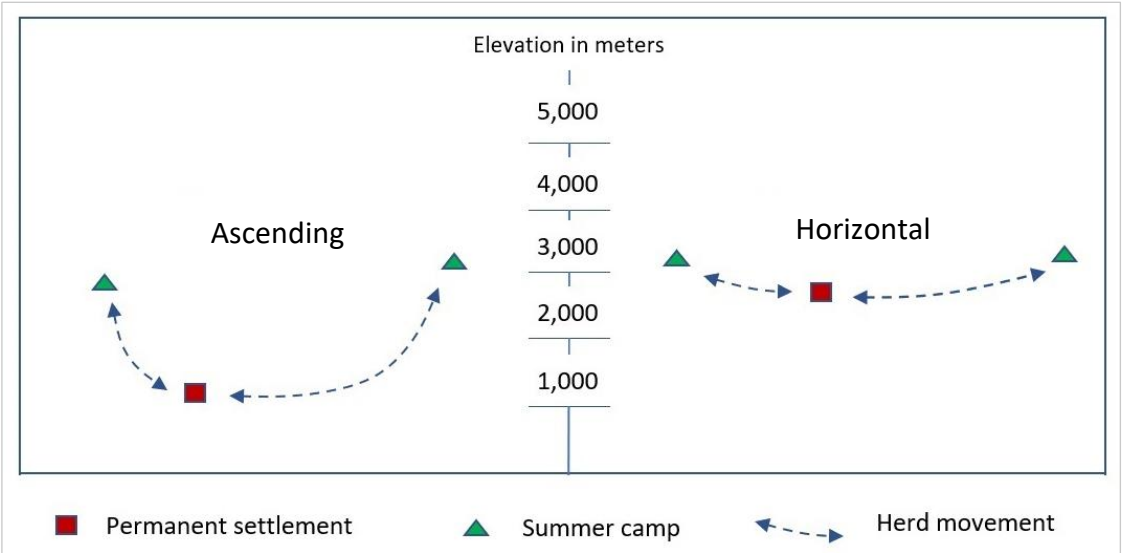

Figure 5.9 Types of seasonal movement of livestock for summer pastures in Kyrgyzstan
Source: Based on own observations in 2015-2018. *Design:* M. Anarbaev

Traditional yurta (Kyr. *boz üi*) is commonly used for the summer camp (Fig. 5.10), as well as a mobile wagon. In summer pastures, livestock herds are kept in open corrals. As a rule, the herd

size of sheep is around of 600-700 head, and cattle can be around of 120-150 head. In addition to a sheep herd, a herder usually keeps up to five milking cows to supply milk products.

Figure 5.10 The summer camp near Lenin Peak Base Camp
Photograph: M. Anarbaev, 2015

Within the collective farms, agriculture was based on communal ownership and the socialist model of animal husbandry significantly changed the former lifestyle of pastoralists. The livestock shelters, called *Koshara* or *Koroo* (Fig. 5.11), were built as the winter shelter for livestock and a large number of livestock remained at the permanent settlements in the highland pasture areas year-round.

Nowadays pastoralists who have more than 200 sheep try to keep their livestock in such livestock shelters that are out-side of the settlement. Villagers who own just a few numbers of livestock keep them in the livestock shelter next to the houses. Such pastoralists are organised in herding groups locally called *kezüü* (Kyr. *kezek* – rotation or turn). This type of rotational grazing method is beneficial for participants in the sharing of limited labour resources (Watanabe and Shirasaka, 2016:145). The group of villagers collect in one flock around of 500-600 sheep to be grazed in near-village pastures. In the past, participants of the *kezüü* herding shift were organised by ‘’equal’’ working days regardless of the number of livestock. For example, the household joins the *kezüü* with 32 sheep and herding the common flock the same day is regarded as the equivalent of another villager who joins the rotational grazing group with 60 sheep.

Figure 5.11 The livestock shelter (Kyr. *Koroo* or Rus. *Koshara*) built in 1960s next to the Kara-Kabak village
On the left corner there is a house for herder facing towards Chong-Alai Range
Photograph: M. Anarbaev, 2015

Since 2010, villagers agreed that 20 sheep is equal to one day of herding. This caused two grazing groups to form, 1) households with a small number of livestock, up to 100 sheep, and 2) households who own from 100 to 150 or equal size sheep herds. Households who own more than 150-200 sheep as a rule have a salaried herder and do not participate in the rotational grazing.

In contrast to sheep and horses, after returning from the summer pastures, the cows stay inside the village. This applies especially to milking cows which as a rule have their offspring in winter.

Horses, cattle and sheep and goats differ in their adaptability to the environment. As a result, the care required for the survival and multiplication of each species varies a great deal.

Among the livestock, the yak (*Bos grunniens*) is well adapted to the high altitude, cold and wind. Therefore, it is a beloved domestic animal in many parts of the highlands of Asia. The yak locally called as *topoz* is widely dispersed in the highlands of Tien-Shan, Pamirs and Tibet. However, the number of yaks in Kyrgyzstan is not as large as other domestic animals. In winter, yaks are capable of utilizing pasture under the snow, up to 10-12 cm depth. In deeper snow cover, feeding is difficult for them (Denisov, 1958:22-26). In Kyrgyzstan, most of the yaks are domesticated. They use the high pasturelands where for other domestic livestock it is difficult to utilize. Yaks can find grass by themselves through the cold winter and mountain climate conditions. They provide durable wool, skin, and a high percentage of butter from the milk, and meat. In most mountainous areas yak is used as a mode of transportation.

In the Soviet time there was a special program on yaks to use highland pastures that were not accessible by other livestock. The number of yaks reached up to 80 thousand (Table 5.5). However, since privatisation, which followed the dissolution of collective and state farms, their number has dropped dramatically. Even nowadays, their total number is still half of that of the 1970s.

Table 5.5 Number of yaks in Kyrgyzstan (in thousand)

	1978	1991	1998	2009	2010	2017
In total	79.2	55.0	17.9	24.8	29.1	42.9
Among them in Osh oblast				3.7	5.1	5.5

Source: Based on Chertkov et al. 1999:103 [1978-1998]; Abazov, 2004:256 [1991]; NatStatCom, 2018:24

It is believed that among the domestic animals, yaks require little care to ensure their survival. Yaks not only can survive independently from humans, but collectively they are able to protect themselves from the wild predators.

> Alai is a great place to keep yaks. In the past we had good yak flocks within the Alai sovkhoz. We had breeding specialists. We had [sovkhoz] over two thousand yaks and I was attending 150 yaks in the *gurt* [herd]. They do not need stall keeping and foraging even in winter. Therefore, requires a little attention.
>
> Mamatyakut Zhusupov (born in 1960), Zhar-Bashy village, 2018

However, predation of yaks also occurs. Usually this happens when a yak is alone or with a young calf. A critical period occurs in May during calving of cow-yaks, and the pressure from wolves increases by several times. Predators can easily attack an unattended flock, where young offspring are easy prey. According to pastoralists, to be able to organise collective self-defence the herd should contain at least 100 yaks. Therefore, in the past, yak herds of sovkhozes numbered 150-300 yaks.

During lactation yak-cows are usually brought closer to the summer camps. They provide little but good milk, which contains 6.8% of fat, while the Kyrgyz breed of cow gives milk with 4.3%. Moreover, the net cost of yak meat is four times lower than that of the local Alatoo breed of cattle. It was estimated that the country has a potential to breed up to 80 thousand yaks without damage to other sectors of the animal husbandry industry and the environment (Denisov, 1958:6).

Generally, milking of yak-cows has a negative effect on calves' growth. Nevertheless, pastoralists are milking them and collecting a dried yogurt known as *kurut* (Fig. 5.12) which is sold for a better price in comparison to that made out cow's milk.

Figure 5.12 Open stillage locally called *Sere* used for drying of *kurut*
Photograph: M. Anarbaev, 2015

As well as in other highland areas of Asia, Kyrgyz pastoralists use yak hybrids (Kyr. *argyn* – crossbreed). Among two ways of hybridisation, the best way is considered to be the mating between a yak-bull and cow. The offspring is less liable to diseases, has smaller bones in the carcass, and better dairy characteristics of fat content which may reach around of 5.3%. However, the crossbreeds have a lower reproductive rate in comparison to pure bred yaks (Denisov, 1958:42).

For centuries Kyrgyz pastoralists raised yaks, mainly on a small subsistence scale and as a lifestyle activity. During the Socialist period in Kyrgyzstan, yak breeding became a relatively large-scale activity, and they were up to 120 specialised kolkhozes (Abazov, 2004:256). In Alai, a yak-breeding brigade was established in 1952 with a total number of 3,000 animals (Yakut, 2014). In the high pasturelands, over 3,000 meters above sea level, where sheep and horse breeding are not economic this area is suitable for yak-breeding.

In comparison to other highland pastures of Kyrgyzstan such as Suusamyr, Aksai, Arpa, Chatkal and Song-Köl, Alai Valley has all seasonal types of pastures (Parmanasov, 1979:13). These areas have winter pastures that are especially suitable for yaks.

Environmental characteristics of the Alai Valley determined its economic profile in past. As well as nowadays, the majority of the population are involved in a livestock-based livelihood. Pastoralism provides milk products not only for self-subsistence but also is the main cash income

sources for many households. Therefore, livestock is their significant source of income and wellbeing.

5.3 The interrelationship of pastoralism and migration

In many developing countries, remittances from abroad are an important source of income especially in mountain areas (Jaquet et al. 2016:494). The lack of jobs, looking for better payment, to secure their livelihoods and other opportunities encourage the labour migration. Nowadays, the remittance from migrants plays an essential role for the national economy of Kyrgyzstan. The republic is listed in the group of developing countries with a high rate of remittances from abroad in their share of GDP (World Bank, 2016:13). In 2006 the country received around 473 million USD as remittances sent back by migrants and this sum amounted to over 1.2 billion USD already by 2008 facilitating trading as well as an increase of the real estate market. For instance, in 2016, the total remittance from abroad, reached 2.43 billion USD, which is one third of the country's GDP. The most popular destination is the Russian Federation from where over 90% of remittances come from (National Bank of the Kyrgyz Republic, 2018). Russia is attractive with its visa-free regime, knowledge of language, availability of social and transport networks (Sagynbekova, 2016:3). In addition, since 2015, the simplified form of work permit within the membership in the Eurasian Economic Union provides certain advantages for citizens of Kyrgyzstan.

In contrast to migrant workers from other regions of the republic, who mainly try and find a job in Moscow, local informants reported that they usually travel to the Siberian part of Russia or the Russian Far East. These areas already have a connection through the existing social networks there, as often it is a relative or friend who has successfully settled there and invites others.

> In wintertime here is nothing to do in the village. So, I go to Russia for seasonal work. One of my friends is on good terms with one Russian businessman who owns a sawmill in Novosibirsk. We work there, the salary is good. After working 4-5 months, I am back to home. Half of earnings usually is used for daily-life and half is to increase my livestock.
>
> Kurmanbek Nadyrov (born in 1985), Kara-Kabak village, 2015

The effects of migration on the local livelihood became a key topic in the academic debate. For instance, the group of authors, Schoch et al. (2010:214) discussed the inter-linkage of animal husbandry with labour migration and its effect on livestock numbers. Livestock is regarded as financial capital and usually determines the level of wellbeing of households in rural Kyrgyzstan.

It is used in many aspects of daily life, slaughtered to express hospitality or in honour of guests, funeral rituals and ceremonies as well as in celebrations. Moreover, it is considered as a 'living bank' (Lim, 2012:48) or 'mobile bank' that can be converted to cash when it is needed (Schmidt, 2011:74). There are various explanations why people try to invest in livestock. Some argue that it is because of the unstable banking system, stemming from the bankruptcy of several commercial banks in the early independence years, which has contributed to the lack of trust. Nevertheless, it is obvious that livestock is an easily convertible asset in rural areas and from the point of view of pastoralists this is a good "investment".

> My son is working in Russia. He is doing construction works in oil exploration group in Siberia. From his remittances I have already made a flock of two cows, 16 sheep and two mares. Next year by God's will, he will have offspring in addition. He will not work always there, so little by little, I will make for him a flock by his return.
>
> Sulaiman Töröbekov (born in 1950), Kabyk village, 2015

Following the privatisation campaign in 1991-1996, the livestock numbers declined rapidly as large numbers of animals were sold or slaughtered for household use (Fitzherbert, 2000). The recovery of livestock numbers in the country started around 2005, and the trend of livestock numbers in the Osh oblast (Fig. 5.13) is similar to other parts of the country.

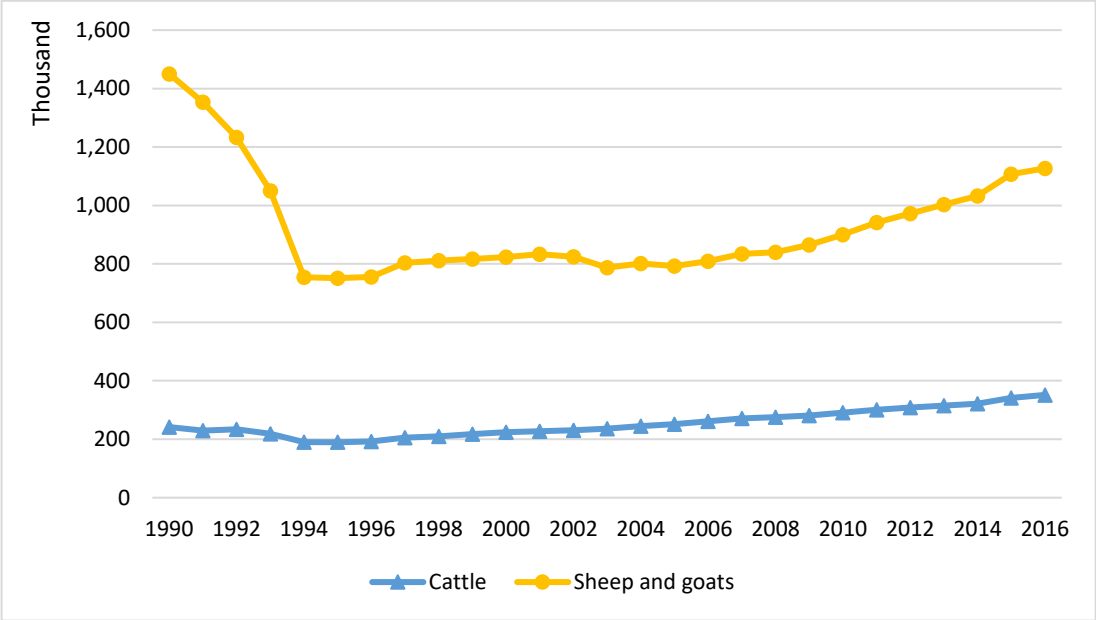

Figure 5.13 The number of livestock in all categories of farms in Osh oblast
Source: Compilation based on NatStatCom, 2008 and 2017:56

The official statistics show the increase of people in the Kashka-Suu municipality who had been temporarily absent (Fig. 5.14). The fieldwork confirmed that this part of the population is working in Russia as labour migrants and their earnings are usually invested in livestock. However, the

increase in livestock numbers requires more forage to be stored for the long winter. The shortage in labour force is acute especially during hay making season in August-September.

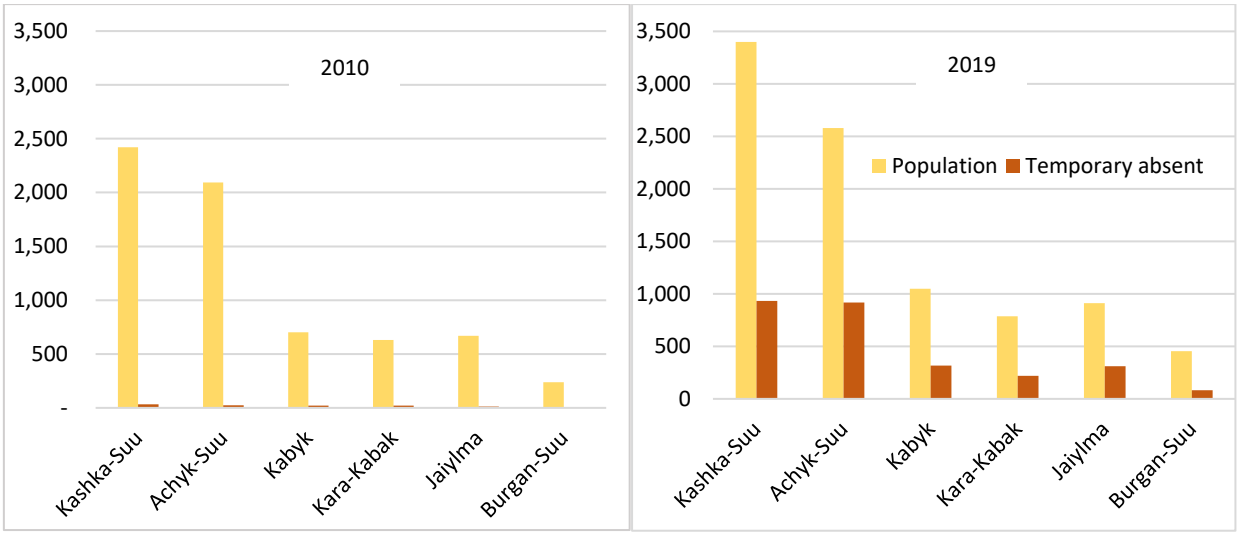

Figure 5.14 Share of temporary absent population in 2010 and 2019 years
Source: Compilation based on unpublished data of Kashka-Suu municipality, 2015 and 2020

It was observed that a household that has a working member abroad is receiving so-called money transfer "for hay". As local sources explained, it is, "to replace the effect of their absence" during the work season. The amount might be around 100 USD which is enough to hire a tractor for hay cutting. This leads to an increase in demand for mowing machinery and baler presses accordingly.

> I have one daughter and two sons working in the market, in Russia. They wanted to present me a car, but I told them, instead of car to buy a tractor for me. Now I work personally, in summer I cut hey for villagers, in other seasons all field works what they need.
> M. Egemkulov (born in 1956), Achyk-Suu village, 2015

Other people use the so-called *ashar* – collective work method to mow and collect forage for winter. During the Soviet time, fodder provision was up to 80% (Djancharov, 2010:4), which usually came from lowland regions of the country. Annually, Kyrgyzstan was importing around one million tons of forage grain for livestock from other grain grower republics (Abdurashitov, 2015:34). As the Alai region was fully oriented on animal husbandry the main issue was provision of sufficient fodder for winter. Construction of irrigation channels enabled the expansion of agricultural land under cultivation. The need for additional fodder for livestock resulted in the establishment of new settlements such as Kabyk, Achyk-Suu and Sary-Mogol villages, where crop cultivation was undertaken to meet the demand of animal husbandry. On suitable land, fodder

crops such as barley, alfalfa and sainfoin were cultivated. But it was not enough and had to be supplemented by fodder brought from other lowland parts of Kyrgyzstan.

Nowadays only a limited number of pastoralists are buying forage-hay from outside the Alai Valley. The main source of hay is collected from the meadows (Kyr. *Chabyk zher*) alongside of rivulets. As a rule, livestock are not allowed to graze there before it is harvested.

The remittance from migrants plays an essential role and cash income source for many households in the Alai Valley. For many people, Russia is the most popular destination for labour migration, which provides more job opportunities. The remittance provides for daily life expenditures and services. However, at the first chance funds are used to increase the livestock holdings which is considered as a good investment.

5.4 Tourism and mountaineering as a source of income

The tourism sector comprises a small portion of the economy of the municipality. The ascent route for Lenin Peak (Fig. 5.15) is accessible from Alai Valley, which is a famous destination among mountaineers (Box 5.3). Mountaineering provides seasonal work for only twenty households, which is about one percent of the total household numbers in Kashka-Suu aimak.

Figure 5.15 Lenin Peak (7,134 m)
Among locals, prevail statement that original Kyrgyz name is Zhel-Aidar (wind driver or wind sender) Interestingly, the Aidar is known as “God of the Wind” in accordance to Kyrgyz mythology
Photograph: M. Anarbaev, 2015

They offer meals, local transport services, meat, milk products and a limited volume of souvenirs, porter and other related services. In comparison to Kashka-Suu, the neighbouring Sary-Mogol aimak receives much more benefit from tourism. There, local people take advantage of their location in the Alai Valley for trekking, horse riding activities, as well as visiting or climbing the Lenin Peak.

They are connected with and receive support from international organisations that promote ecotourism in Kyrgyzstan. For instance, the Swiss Agency for Development and Cooperation supported the Kyrgyz Community Based Tourism Association **"**Hospitality Kyrgyzstan**",** which was initiated in 2000, and has a CBT Sary-Mogol branch, which was launched in 2006. Under the circumstances, people of Sary-Mogol are comparatively more exposed to tourism than their neighbours. Despite the fact that local residents do not see tourism as a main activity, most of them are interested and show a willingness to work in the touristic sphere (Watanabe et al. 2009:8).

Box 5.3 Mountaineering

Also called mountain climbing, it is a type of adventure sport tourism associated with climbing activities at altitude (Pomfret, 2006:113). In European and Russian languages is it usually called *alpinism* and a person dealing with this sport is an *alpinist*.

The first expedition to attempt an ascent to the highest peak of Alai Valley took place by a Soviet-German Scientific Expedition in the autumn of 1928. For the first time, Alpinists Erwin Schneider, Eugen Allwein and Karl Wien succeeded in climbing the Peak Lenin (7,134 m). The number of climbers since that time has increased significantly 1928 – 3, 1934 – 3, 1937 – 8, 1950 – 12, 1958 – 62, 1969 – 888 alpinists (Beletsky, 2013:4), and has now reached over 200 people annually. There is an unofficial "Snow Leopard" title among alpinists, which has actually replaced the title "The Conqueror of the Highest Mountains of the USSR" established in 1967. To receive this title, an alpinist should climb all "seven thousand" peaks of the former Soviet Union (Andreev, 2005).

The local budget of Kashka-Suu municipality is fully subsidised from the republic's budget. Nevertheless, local authorities are interested in tourism development. For instance, each August a tourism fair is organised at the Base Camp (Fig. 5.16) of Lenin Peak, accompanied with national sport games. According to the Kyrgyz Association of Tour Operators, over five thousand tourists buy climbing programs in Kyrgyzstan per year (Kostenko, 2018).

Private companies receive the significant share of considerable revenues created by tourists, but the involvement of locals in Kashka-Suu aimak is still very low (Watanabe et al. 2013:112).

Working season is from 5 July to 1 September. I work with all companies presented here. In my team I have ten boys with horses. They deliver goods and backpacks of climbers to the next camp and receive two USD per kilogram of delivered weight. Here I have installed three yurta and as a local assistant I am responsible for security, transport, meat and other related things. For my job I get 2,200 USD. During the season Base Camp consumes milk and dairy products in amount of 400-500 USD. I bought one camel, one hour of ride around camp costs 25 USD.

Myrzapaiyz Paizyldaev (born in 1961), Kara-Kabak village, 2015

Figure 5.16 The Base Camp Achyk-Tash, also known as Alplager
The camp used for adaptation to the high altitude, preparing an attempt to the summit and providing the alpinists with many other kinds of support
Photograph: M. Anarbaev, 2015

Within the administrative border, the Lenin Peak base camp belongs to Kashka-Suu aimak. Tourist companies started to pay a usage fee of five thousand KGS (476 USD)[101] from 1995. The local authorities have increased the payment in recent years. Nevertheless, the share of tourism as an income source is low.

We have contracts with nine main companies who bring mountaineers to the Lenin Peak. They all together pay 181 thousand soms (2,600 USD) as land tax

Mirlanbek Saparaliev, Head of Kashka-Suu aimak, 2015

Most of the alpinist tourism companies have headquarters in Tashkent, Moscow, Saint Petersburg and Almaty. Generally, alpinist tourism is connected with the operation of alpinist

[101] In exchange rate of 1 USD = 10.5 KGS in 1995.

clubs established in those cities in Soviet times. It is only in recent years that tourism companies based in Bishkek or Osh have become active in offering a climbing package for Lenin Peak. In 2005, the tour operators based in Tashkent and St. Petersburg guided almost 90% of tourist groups visiting Lenin Peak (Watanabe et al. 2009:9). Nowadays this percentage is lower and represented with nine main companies registered in Kyrgyzstan. However, all of them are contracted with companies based in Russia, Uzbekistan, Kazakhstan and the flow of tourists is facilitated by the clubs in the above-mentioned cities. Mountaineering is a specific sport, which requires strict safety instruction and professional guiding. Therefore, the recommendation of previous climbers is important in choosing a company. As a rule, travellers tend to choose a company that has long experience, history and a good reputation.

The Pamir Highway route is famous among tourists especially from Europe. The Alai Valley has tourism potential and international attention is increasing year by year. In comparison to the Sary-Tash, which is on the cross-roads, the Kashka-Suu aimak is some distance from the main route, and only a limited number of travellers visit the case study site. The Base Camp near Lenin Peak provides limited and short-term job opportunities for some households. Therefore, the contribution of tourism to the budget of the municipality is not significant. In addition, the cash income to local households from tourism and mountaineering is limited, with the short season and lack of suitable hotel facilities.

5.5 Job opportunities in coal mining

Since independence, there have been difficulties with fuel supply. The population in Alai was mainly reliant on biomass dung (Kyr. *tezek*) from the livestock, as the region has limited access to firewood. The Alai Range is rich in middle-scale brown coal deposits which were actively investigated during 1971-1980s. After the geological survey during 1993-1995, industrial coal mining started in 1995 in the Kyzyl-Bulak deposit by open-pit method, by a private company,[102] in the upper side of Sary-Mogol village. Annual production is around 650 thousand ton (NatStatCom, 2016b:229) and the coal is widely distributed beyond the administrative border of Osh oblast, as well as to Tajikistan.

Since the operation of Kyzyl-Bulak coal mining branded as Sary-Mogol coal, there has been an increase in coal use in the Alai Valley. As Kashka-Suu municipality has informed, the availability of coal is also affecting electricity consumption (Fig. 5.17).

[102] Before used by “Ken” and “Osh-Pirim” companies. Nowadays this pit is run by “Perity Coal Ltd” registered since 2004.

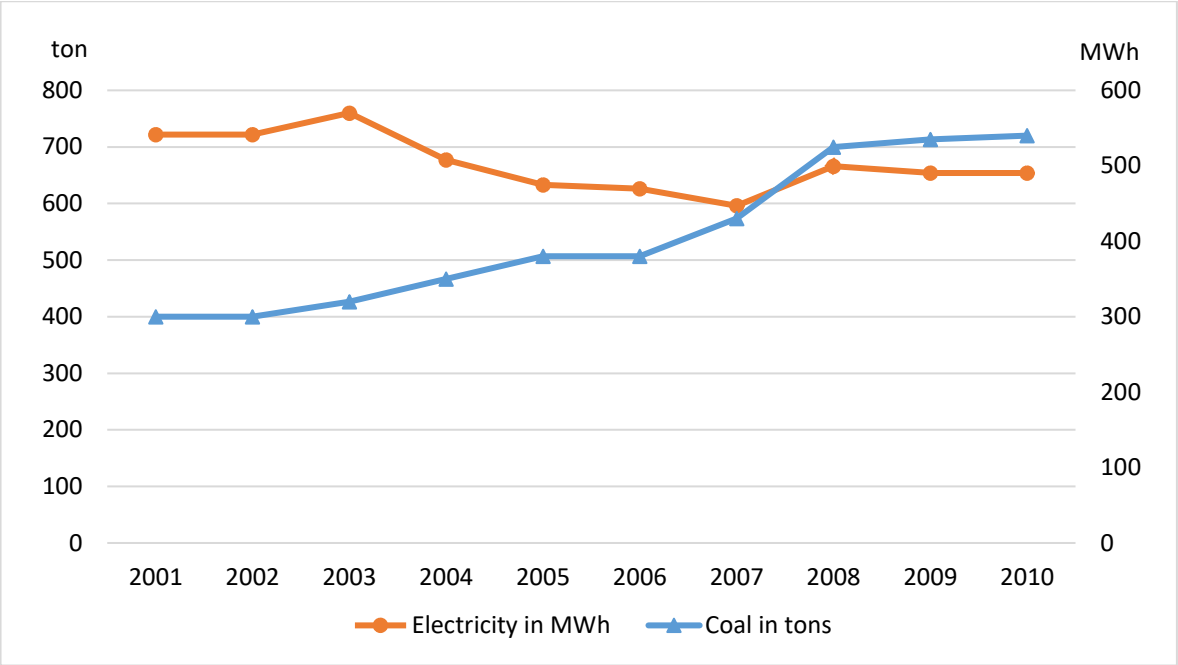

Figure 5.17 Type of energy sources and consumption in main social institutions
School, kindergarten, municipality office and medical station
(FAP Feldshersko-Akkusherski Punkt) of Kashka-Suu aimak
Source: Compilation based on unpublished data of Kashka-Suu municipality, 2012

While the average electricity consumption in the republic has increased (State Agency on Environmental Protection and Forestry, 2016:140), in the case study site it is the reverse, as heating generated from the use of coal.

The coal mining enterprise has generated job opportunities for local people especially for Sary-Mogol and Taldy-Suu municipalities. Usually residents of Kashka-Suu municipality are not working there permanently. As a rule, they go for a short time and mainly receive their salary in coal.

I go to the mine and work around one week. This is enough to get 4-5 ton of coal which is help for us in wintertime
Zhoodar (born in 1990), Kara-Kabak village, 2015

Since 2013, there has been active discussion with the villagers of Kara-Kabak concerning permission for coal mining by "Azamat Kashka-Suu Ltd". This company received a coal investigation license[103] for 2013-2019, however there was a strong resistance by local people to mining. Many of the conflicts relate to risks of losing pasture, air and ground water pollution, as the mining encroaches on the borders to the village. Steinmann (2011) discussed such a case in Naryn oblast of Kyrgyzstan.

[103] State Committee of Industry, Energy and Subsoil Use of the Kyrgyz Republic, http://www.gkpen.on.kg/Licenses

Interestingly, the main investor for middle and small-scale mines are Chinese companies, while Russian or Western companies prefer to work with big gold deposits. In general, the political elite and government officials are willing and want to work closely with the Chinese Government and business structures. However, there is a strong resistance in society for Chinese presence and opposition powers actively use this mood of locals for their own interest in elections. The concern against any Chinese expansion has historical as well as economic aspects. Such demonstrations took place in 2010 regarding the Zhetim-Too iron deposit, and in 2019 regarding the Solton-Sary gold mine of Naryn oblast. Another strong anti-Chinese demonstration was held in At-Bashy in 2020. Despite the promise of jobs for 15,000 people, and an investment of 280 million of USD for construction of the Logistic Transit Center between Kyrgyzstan and China, the construction was then cancelled (Kadyrov, 2020).

> If coal mining will take place, then the village will be under the coal dust.
> We have already coal mining in Sary-Mogol, why we should open another one?
> Kutbidin Andarov, former Head of Kashka-Suu aimak, 2015

As an example, villagers refer to the case of Sary-Mogol village, which in their point of view suffers from the dust that comes from the consistent running of the trucks. People also worry about the impact of mining on ground water levels, as the drinking water supply comes from local spring sources. While some people are against this new economic activity, some in support justify the necessity of the mining due to a lack of employment opportunities in the region, with possibilities for income to the local budget and other socio-economic benefits. After several public hearings, villagers proposed that they might agree if the company would consider a compensation and resettlement program for them. However, such requirements might be economically unattractive for middle-scale mining.

Nevertheless, the prospective mining company is regularly sending its ambassadors to explain the techniques of coal extraction and provision for safety norms, promising a high number of job places and investment for social infrastructure. Finally, the majority of residents declare that they will agree if the company relocates the village to another safe place. This means the company should construct modern and standardised houses with all the facilities that are required for a good life. In response to this possible opportunity, the number of Kara-Kabak households has increased from 80 to 162 households during the past few years (K. Andarov, personal communication, 2019).

5.6 Fishing in the Kashka-Suu aimak

Kyrgyzstan has more than 3,500 rivers and rivulets that have formed from glacial meltwaters. Recreational and subsistence fishing takes place on 33 rivers, but mainly on the Naryn, Chui, Talas, Kara-Darya and their tributaries (Thorpe et al. 2009:146). To be legally eligible to fish on a river or water pond, a person should be a member of the Kyrgyz Association of Hunters and Fishers (Rus. *Kyrgyzokhotrybolovsoiuz*) and buy a ticket or fishing card from the territorial office of the State agency on Environmental Protection and Forestry.

Authors Petr and Mitrofanov (1998:145) note that in the past, traditionally, fishing played little role in the local livelihood of Central Asia. The history of commercial fishing, particularly in Kyrgyzstan goes back to the 1870s around Yssyk-Köl Lake and coincides with the arrival of Russians into the region. The Lake is self-contained, surrounded by the Küngöi and Teskei Alatoo[104] mountain ranges. Later, under Soviet rule, aquaculture significantly developed after 1930s. In order to increase the commercial fishery of valued species, between 1930-1936, around 1.5 million eggs of the Sevan trout (*Salmo ischchan*) from Armenia were released into the lake (Thorpe et al. 2009:147). The adaptation of the predator fish species was successful. The trout's fecundity and growth rate increased five to six-fold, and the size of trout became much bigger than in its place of origin (Petr and Mitrofanov, 1998:160). However, this intervention has led to profound changes in the qualitative and quantitative composition of the Issyk-Köl Lake and has negatively affected a number of the native ichthyofauna.

After the 1960s, the commercial fishery benefited significantly from the development of irrigation systems, which resulted in the construction of many water reservoirs for cotton production (Kreutzmann, 2016a). Nevertheless, in fish production, Kyrgyzstan was in last place within Commonwealth of Independent States[105] producing only 1,447 and 48 tonnes in 1989 and 2005 respectively, while Tajikistan and Armenia were producing 3-5 times more fish (Thorpe et al. 2009:143). Nowadays in comparison to the country's major lakes and reservoirs, river fishing is poorly controlled and there are many signs of overfishing.

Water ecosystems provide many benefits to the people. Besides their use for irrigation, water bodies are suitable for and offer many varieties of fish. Fish play an important income source and

[104] On old topographic maps (1:500 000, 1983-84) it was mistakenly written as Terskei, and explained as "opposite" to the Mountain Küngöi Alatoo (Kyr. *kün* is the sun, accordingly the sunny exposition of the mountain range), however the correct version is the Teskei Alatoo, which means the shadow exposition of mountain.

[105] The Commonwealth of Independent States (CIS) is the international organisation for promoting cooperation in economic, political, humanitarian, and military affairs. The CIS was formed in 1991 following the dissolution of the Soviet Union by former Soviet republics except Baltic states.

employment in many parts of the world. In addition, especially in rural areas, they can be a significant source of high-quality protein in human nutrition (Graham et al. 2017:2).

The Alai Valley is home for the beautiful and unique Amu-Darya (Oxus) trout (*Salmo trutta oxianus*) locally known as *forel* or *khan balyk*. (Fig. 5.18). This subspecies is found in the clear inflows of the Kyzyl-Suu River at an altitude of 2,800-3,400 meters above sea level. It is recognised that the Alai Valley has among the highest natural *Salmo trutta* distribution in the world after the Hindu Kush in Afghanistan (Schöffmann, 2001:54). Especially, the northern tributaries of Balyk-Zhuugan and Balykty rivers within the Kashka-Suu aimak, are (Kyr. *balyk* – fish, literally plenty of fish) famous spots for trout fishing and are subject to overfishing. This causes many environmental concerns among locals as well. In 2012, some local activists initiated a moratorium on fishing and some families wanted to run a pond-based fishery along the rivers.

Figure 5.18 Amu-Darya trout *(Salmo trutta oxianus)*
The easternmost range of distribution of Salmo trutta found only in Alai Valley. In appearance the trout is with irregular shaped spots, predominantly red along the sides, dark brown towards the back are coloured
Photograph: M. Anarbaev, 2015

However both of these ideas failed, because the river banks are in demand for hay collection. The locals fish *sazan* or common carp (*Cyprinus carpio*), and trout which sells at three times the price. The trout sells at a price of 400-600 KGS (8.5 USD) per kilogram. There are around ten to twenty households (called *balykchy* – fisher) that regularly deal with fishing for sale and people know them. Fishing involves less than one percent of the total households in Kashka-Suu and pastoralism remain as the key income source.

Schöffmann argues that (2001:56) the growth of trout is limited by the harsh climatic conditions in these high elevations as well as by the nature of the rivers which have a high flow velocity. Therefore, the size of this valuable fish species rarely reaches more than 20 to 25 cm in length.

In accordance to the ''Regulation governing recreational and sport fishing in water bodies of the Kyrgyz Republic''[106], trout fishing is not permitted during the spawning period, which is from 15th October to 15th December. However, due to the lack of enforcement this limits the growth of the fish population. Amateur river fishers may catch the trout year-round despite their size and even small fish are taken.

The abovementioned regulation prohibits catching trout less than 20cm in length. Moreover, the recreational and sport fishing is defined as the activity carried out by individuals for personal consumption, for recreational purposes or sports, without the goal of generating cash income.

Despite the low population density in Alai, fish poaching is high and therefore natural fish resources in the rivers are low. According to Government Decree[107] No 224 signed on 3rd May 2013, persons illegally fishing Amu-Darya trout can be fined 505 KGS (7.5 USD) per fish.

Interestingly, there are ample fish in the small lakes in the northern part of the valley. However, nobody goes there to fish, as they have a bad and mysterious reputation. For instance, in Damzhailoo Lake, people are afraid to fish. Legend says that anyone who touches the fish from this lake will end up with a bad experience soon, as well as in moraine Lake Tulpar-Köl. Locals even do not swim in these lakes and there are many other similar legends concerning lakes in Alai. In those places people do not disturb biodiversity or harm the environment. Such mysterious, spiritual or sometimes shrine characteristics of a place bring benefits to the nature conservation.

The Alai Valley, being a remote but strategically important outpost of the Soviet Union, received regular support, and state subsidies were mainly directed to agriculture. Environmental characteristics of the Alai Valley and traditional occupation of local inhabitants determined its economic profile. Construction of irrigation channels made it possible to expand the area of arable land to some extent but the use of pasture for livestock grazing remained a main type of land use in the Valley.

Since independence, the Kyrgyz Government implemented the economic transformation policy which focused on decentralisation, comprehensive development of private enterprise, and

[106] Approved by Decree of the Government of the Kyrgyz Republic, No. 410 on 24 June 2015. See http://cbd.minjust.gov.kg/act/view/ru-ru/97696?cl=ru-ru

[107] Decree of the Government about the "Approval of rates for calculating the amount of damages caused to biodiversity". See http://cbd.minjust.gov.kg/act/view/ru-ru/94337?cl=ru-ru

stimulation of competition. Dissolution of the kolkhozes and sovkhozes, privatisation of their assets, and the distribution of livestock into the hands of the rural population further stimulated a livestock-based livelihood. At the same time, this transformation process demanded new institutional and legal arrangements in pasture use, markets, veterinarian services, as well as management of human-wildlife conflicts.

Tourism, mining, and development projects in the Alai Valley provide limited job opportunities and the majority of the local population remain in a traditional livestock-based livelihood. Pastoralism provides dairy products not only for self-subsistence but also is the main cash income sources for many households. Particularly in Kashka-Suu aimak only a few households do not have livestock, which indicates the role of livestock for their daily life. Therefore, livestock is their substantial source of income and investment. Accordingly, livestock losses due to the wild predators have been perceived as a threat to their wellbeing.

6 Living with livestock and predators

The grass cover in the Alai is tall and thick, sparkling with many flowers. Numerous wolves roam across the valley (Kuznetsov, 1948:166, own translation)

Historically, animal husbandry has been an important economic driver, and for a long time, wild predators have been considered as a main threat to the industry in socialist Kyrgyzstan (Bibikov, 1985; Vyrypaev and Vorobyov, 1983). As well as nowadays, pastoralism is the major income source of rural livelihood in the Republic. Therefore, depredation of livestock by wild predators such as wolf, snow leopard, jackal, lynx and brown bear has been perceived as a crucial problem by many pastoralists. Accordingly, these wild predators were hunted and culled by various means. In this regard, a way of use and regulation were under change over time. For instance, the wolves have been perceived as the main threat to livestock, as well as a competitor by the hunters of game species. Therefore, they have been persecuted and extirpated from many parts of the world (Nilsen et al. 2007:995). Among the wild predators, the wolf is perhaps the most frequently blamed animal for livestock depredation in Alai as well as in other parts of the country (Fig. 6.1).

Figure 6.1 The male wolf was caught on trap, when he was attempting to enter to the livestock shelter in the Chak village of the Alai Valley
Photograph: M. Anarbaev, 2014

Wolves as a large predator, shapes the structure and functioning of the ecosystems in which they inhabit (Beschta and Ripple, 2009; Kochetkov, 2018). The wolf is an active predator with a wide

habitat range and a variety of hunting techniques. When there is a lack of prey in their primary habitat biotopes, they move to others. Moreover, the presence of predators has had a great impact on the behaviour of wild ungulates. Predators change their movement and activity which has ecological significance (Miller et al. 2001:208).

The high reproductive ability and mobility, in addition to a sufficient food base, allow this predator to maintain a high population (Vyrypaev, 1979:18). There are still some questions about wolf subspecies and discussions are generating less consensus. According to Vyrypaev and Vorobyov (1983:7) two wolf subspecies *Canis lupus chanko* and *Canis lupus desortorum* occur in Kyrgyzstan. The *Canis lupus chanko* refers to the Tibetan wolf found in the Pamirs, Tien-Shan Mountains and across Tibet to Inner Mongolia. With a well-developed undercoat, soft fur in winter, along the spine there is a visible dark stripe. In the Central Asian fur trade, the race corresponds to the "forest-mountain wolf" (Heptner et al. 1967:141). However, Nowak (1995:396) considers these names as synonyms and classifies the wolf population in Europe, Southern Siberia, China, Mongolia, Korea, Himalayan region and Central Asia as under *Canis lupus lupus* Linnaeus, 1978. The entire species *C. lupus* is appropriately classified as "Least Concern" by the IUCN (Boitani et al. 2018:2) nevertheless there are many conservation projects and reintroduction programs especially in Europe and North America.

In many areas of Kyrgyzstan, wolves are sharing their habitat area with other wild predators, especially to the snow leopard and brown bear. Direct competition between these species is mostly avoided through differences in prey selection and hunting tactics, although there is still substantial dietary overlap with the snow leopard (Jumabay-Uulu et al. 2013).

Wolves are social animals and usually live within packs. According to Hernandez-Blanco et al. (2005:80), a pack of wolves is a family consisting of an adult mating pair[108] and their offspring from several generations, which constitutes a form of social organisation. The family group occupy a specific territory. The size of an area may vary from region to region and depend on food availability as well as population density.

According to Vyrypaev (1985:509), in Kyrgyzstan the habitat range of grey wolf is estimated at 140,000 km^2 and in many places overlaps with the range of the snow leopard and brown bear.

[108] In the past, the prevailing view on grey wolf packs was that pack members live within strong hierarchy dominance shaped by the "alpha status" of a mating pair, which has gained considerable popularity among the academic community. This term was coined in 1947 by Rudolf Schenkel and later popularised by the wolf researcher David Mech in his book "The Wolf: Ecology and Behavior of an Endangered Species" (1970). Later in 1999, this author formally disavowed this terminology. He found additional evidence that the concept of an alpha wolf is appropriate to captive wolves thrown together. While in nature, a wolf pack is a family including a breeding pair and their offspring of the previous 1-3 years. See Mech, L. David. 1999. "Alpha Status Dominance and Division of Labor in Wolf Packs" Canadian Journal of Zoology 77:1196-1203.

By the middle of the 1980s the highest average wolf density was in the central part of the country, with up to 40 wolves per one thousand km^2. While in the Alai region an estimated average number was up to 25 wolves per one thousand km^2. The Alai region is ideal habitat for wolves which has presented a problem for pastoralists in the past and nowadays (Watanabe et al. 2010).

> Now is a good time. Before we were not able to grow our own flock. The government was limiting us. Now just pay for pasture and you can keep as many as you wish… However, regarding to the wolves, government should help us to protect our livestock from wild predators... Otherwise our sweaty work is for nothing.
>
> Begali Murzakanov (born in 1973), Kara-Kabyk village, 2015

During the Soviet time there was a limitation placed on the holding of livestock in private ownership. Even in many documents a private ownership was replaced with the category of "individual use". For instance, in statistical reports it was noted as "livestock numbers of collective and state farms" and "number of individual use livestock". The quantity of livestock to be held for individual use was limited in accordance to a Charter (Rus. *Ustav kolkhoza*)[109] of every kolkhoz. According to article 43 of the Charter, the family of a collective farmer could have one cow with offspring up to one year old, one head of young cattle up to two years of age, one sow, and up to 10 sheep and goats. For the livestock over the limits, villager was obliged to provide meat or give livestock offspring to the kolkhoz within the frame of state procurements under a condition of fixed pricing (Rus. *Kontraktatsiya*). Replacing some types of livestock with others according to national characteristics and geographic condition was possible by decision of the government of the republic within the Soviet Union. Then the limit and type of livestock would be discussed in the council of the kolkhoz and every kolkhoz had separate decision-making power (Elchaninova, 2012:59). However, for entire Kyrgyzstan the limits were practically the same. The difference in the type of domestic animals was determined by geographical landscape characteristics and traditional experience. Lowland regions had a preference for cows and sheep, while mountain regions preferred horses and cows. The horse was necessary as a means of transport.

> Here in the summer pasture of Teskei [Base Camp], I am herding 700 sheep in total. From the flock, 250 belong to the people of the Zhaiylma and 450 belong to only one person. His name is Yman and has *koshar* [livestock shelter] in the terrain called Kyrchyn. For my job I get 35 Som per head of sheep. Personally, I have four milking cows, we use them to stock necessary quantity of the *kurut-mai* [general term for milk products such dried yogurt, butter and

[109] The most widely applied Model Charter of Kolkhoz is from 1969 as adopted by the Third All-Union Congress of Collective Farmers and approved by Resolution of the Government of the USSR on 28.11.1969 No. 910. See http://pravo.levonevsky.org/baza/soviet/sssr5092.htm

cheese] for the winter. In a year, due to wolves I lose 14-15 sheep. If I show the dead body [carcass] with the owner's sign on ears, I do not compensate the loss. If it is stolen or somehow got lost, I pay the lost in cash or replace in live.

Sherali Sartekov (born in 1979), herder, Zhash-Tilek village, 2015

The market for meat is not stable and price varies season to season. For instance, in autumn especially in August and September the prices are lower. When livestock come down from summer pastures and many pastoralists are selling them. According to respondents they need income to prepare children for school, send them to higher education, or provide for a wedding ceremony etc. During winter or spring, the price of livestock may differ. As far as for compensation of a lost animal, the age or classification of livestock is essential. Therefore, in the case of livestock loss, as a rule, a herder will compensate by "replacing" the lost animal rather than a cash payment according to the age and type of animal. This way of problem solving is very common. Accordingly, a herder before taking the animals for his herding duty, he makes notes about their age, colour, and condition.

6.1 Livestock depredation by wolves

What is the spring? Spring is an effort. What is the summer? Summer is grace.
What is the autumn? Autumn is income. What is the winter? Winter is loss.

Kyrgyz proverb

Livestock losses due to the wolves was always among key issues for pastoralists. Based on the study of Vyrypaev and Vorobyov (1983:45), it is known that, in socialist time when the country had a much higher number of sheep in the highland pastures, livestock constituted a significant proportion of their diet, making up to 21.3% in the Chatkal Mountains, 22.6% in the Teskei Alatoo Mountains and up to 15.2% in the syrt zones of Naryn and Yssyk-Köl oblasts (Table 6.1).

The wolves can survive up to two weeks without food and usually start predating sheep on a frequency of every four days or cattle after 13 days. At one meal, an average wolf can consume up to ten kilograms of meat. Moreover, the study indicates that absence of marmots during winter leads to a rapid growth in livestock depredation, and in places where wild ungulates are available attacks on livestock are two times less (Vyrypaev and Vorobyov, 1983:45-48). Nowadays, there is no available recent data on the proportion of domestic animals in the diet of wolves in Kyrgyzstan.

Table 6.1 Composition of annual diet of wolf pack

Type of prey	Chatkal Mountains		Teskei Alatoo Mountains		Central Tengir-Too	
	% in the diet	In kilograms	% in the diet	In kilograms	% in the diet	In kilograms
Wild boar	44.1	280-340	7.5	50-60	-	-
Argali	-	-	-	-	22.5	160-190
Ibex	12.6	80-110	11.3	80-90	10.4	70-90
Roe deer	5.9	35-55	30.2	210-250	-	-
Hare, fox, badger	4.3	25.8-38.5	13.3	50-85	5.5	20-27
Marmot	3.8	25-35	11.3	75-100	39.6	275-330
Livestock	*21.3*	*150-170*	*22.6*	*160-180*	*15.2*	*110-135*
Birds	0.4	1.5-2.5	-	-	6.7	2.5-4.5
Other rodents	7.6	25-30	3.8	14-19	0.1	2.5-3.5
		622.3-781		639-784		640-780

Source: Vyrypaev and Vorobyov, 1983:50

The study of wolf attacks on livestock in the Central Forest Nature Reserve of Russia shows that an increase of depredation takes place in summer-autumn, in the period of training of wolf cubs in methods of killing prey (Kochetkov, 2018). In Kyrgyzstan, livestock predation by wolves occurs year-round but it can be seasonal in character (Table 6.2) and greatly increasing in certain seasons of the year. During my fieldwork, many respondents indicated that in wintertime, pressure from wolf predation is increasing. It is mainly connected to the availability of wild prey in winter, consequently in areas where wild ungulates are in good numbers, risk of livestock depredation is lower.

Table 6.2 Livestock predation by wolves and most affected type of livestock

Low	Medium	Severe	High
Summer	Autumn	Winter	Spring
All unattended livestock	Sheep and goats	Sheep and goats, horse, yak	Horse offspring, yak offspring

Source: Based on own field survey in 2015-2018

From another perspective, the livestock herding practice also plays an important role regarding the “availability of prey” for wild predators. In the socialist era, during winter, livestock was kept in livestock shelters, but to enable this, the collective and state farms were provided with hay and forage. Nowadays Kyrgyz pastoralists are practicing an open space herding in winter as well (Fig. 6.2). The main reason being is to economize on the scarce reserve of hay. But this practice makes livestock an attractive prey and provokes wolves to approach around the winter quarters. Consequently, this leads to an increase in the of risk of livestock predation by wolves.

Figure 6.2 Livestock is grazing near the Kashka-Suu village in winter which makes livestock an attractive prey for wolves
Photograph: M. Anarbaev, 2014

Moreover, most villages with a wolf problem are located in former summer pastures where due to the state program of sedentarisation in the past, there are nowadays permanent settlements. According to traditional mobile pastoralism practices, these pastures were used in summer and by winter they were a livestock-free land.

Considering these factors, it is possible to reduce damage to pastoralists by introducing appropriate correctives into the livestock herding practices and keeping them in proper shelters during the night. In many hotspots these arrangements became a part of wildlife damage management.

6.2 Wildlife damage management

It is known that the wildlife resource provides many benefits for humans and society in general. There are many types of them which can be sorted into positive values such as recreational, physical utility, scientific, spiritual, historic and ecological. From another perspective, there are cases when wildlife causes problems for people. It can be an economic loss, physical damage, human injuries or disease, security or reduction of well-being of people. Anything that wildlife causes for human security, or affects the reduction of quality of life or well-being is referred to as wildlife damage. Accordingly, the goal of wildlife management is 'to increase the value of the wildlife resource for society while protecting it for the benefit of future generations' (Conover, 2002:15).

In many developed countries there are specially designed compensation schemes for wildlife damage. This way of creating tolerance and as a conflict mitigation tool is dominantly in use in regard to large animals. A majority of species covered by programs includes the order carnivora (81%) such as lynx, tigers and wolves. The most common reason for compensation is represented by livestock losses (Ravenelle and Nyhus, 2017:1250). Compensation programs are also introduced in some developing countries and mainly financed by international NGOs. Which means it is mostly dependant on external funds. Accordingly the effectiveness of a compensation scheme is widely debated (Bulte and Rondeau, 2005). In Kyrgyzstan there is no such compensation program, but wildlife conservation projects promote proper construction livestock shelters, the use of dogs, stall-feeding and housed in winter. Which is in turn perceived by pastoralists as the additional expenses.

During the Soviet time, a herder (Rus. and Kyr. *Chaban*) was obligated to compensate a loss of livestock caused by a number of reasons. For this purpose, as a rule in addition to the herd of collective or state farms he was keeping several of his own livestock. Interestingly, nowadays compensation for the loss of livestock due to wild predators is not made to the owners by a herder. The same practices are applied as well in other parts of the country only with slight differences. For instance, in Naryn, a herder will compensate the loss or at least half the value, if more than ten sheep are killed at once, as this is perceived as improper work done by the herder (Kurmanbek Ömürzakov, personal communication, 2016). Probably because of this tradition, wolves are perceived by owners in much higher antagonism rather than herders.

There are a number of papers about livestock losses due to wildlife, especially by snow leopard, wolves and brown bears (Jackson et al. 1996; Lescureux and Linnell, 2013; Woodroffe et al. 2007). For instance, according to Jackson and Wangchuk (2001:139) in Ladakh in the Himalaya, the snow leopard and wolf were associated with 55% and 31% respectively of the presumed depredation incidents. There, pastoralists lost one to 15% or more of their domestic stock to predators. Or in Bhutan, 2.3% of domestic animals were killed by predators in a period of one year (Wang and Macdonald, 2006:561). While my field survey in the Alai Valley and Naryn constitute 2 to 5% loss due to wolves, and in rare cases to the snow leopard. However, these estimates can be higher if so called “surplus killing” occurs. A multiple killing case of livestock by predators in a single event is widely claimed by herders (Linnel et al. 1999:700). Usually it happens when predators gain access to the corrals. For instance, there is a reported case, when two brown bears on 22 July of 2018 killed 67 sheep inside a corral in the Besh-Terek summer pasture of the Alaiku Mountains. This place, situated next to the Kara-Shoro Nature Park, was discussed by the local Pasture

Committee with the administration of the nature park as well as with the pastoralists on how to solve the issue.

Other livestock losses

In the case of mobile pastoralism in Kyrgyzstan, there are several other reasons for loss of livestock, other than wild predators, including:

- Transport-related, an accident on the road (5%)
- Disease (up to 15%)
- Natural hazards (lightning, stone fall, avalanche, early snowfall (up to 45%)
- Theft (up to 10%)

The above stated estimates derive from field surveys (2015-2020), while the percentage of losses due to natural hazards were estimated based on reports in the Mass Media. For instance, according to the Sputnik-Kyrgyzstan, on the night of 18 July 2018 in the pasture Suran, Tüp rayon of Yssyk-Köl oblast, 44 sheep and 12 goats were killed by lightning[110], and in Naryn oblast, an early snowfall on 10 September 2019 in the summer pastures of the Suusamyr highland valley caused the death of over 250 sheep and ten horses[111]. Nevertheless, even a small loss from a wild predator is perceived as very acute by pastoralists.

> I have friends working in Moscow, they want to buy horses and want me to keep them. I will be responsible for all risks. But because of wolves I am not doing this business. I want wolf-free pastures or at least the wolf population should be regulated
>
> Abdykadyr Kozhokmatov (born in 1977), Kara-Kabak village, 2015

The theft of livestock is another issue for pastoralists. According to the report by the National Statistical Committee of the Kyrgyz Republic, annually, around one thousand cattle-stealing cases are recorded. The peak was in 2011 with 1,246 registered cases. The share of cattle raiding in the total number of registered crimes in 2014 accounted for 3.6 percent (NatStatCom, 2015:24). As a rule, stolen livestock are cows and horses. Therefore, due to their high price, it is a substantial loss for pastoralists. Most of the stolen livestock is taken to the distant livestock markets (Kyr. *Mal bazar*) or smuggled into neighbouring countries.

In Kyrgyzstan wildlife damage management is not formalised and organised based on traditional practice. As a rule, a herder just shows the head or carcass of livestock as proof that it was killed

[110] See https://sptnkne.ws/zFdQ
[111] See www.turmush.kg/ru/news:1567567

by a wild predator, to avoid compensation of loss to the owner. Since 2015, after the Snow Leopard Conservation Forum in Bishkek, there were some discussions about compensation schemes for livestock depredation caused by snow leopard. It was proposed that funds which accumulated from trophy hunting can be used for the compensation payments. However, except that it required large amount money, this initiative raised several other organisational issues such: as who will fill-out the protocols about damage; what can be accepted as a proof that it was killed by snow leopard, not by wolf for instance; how damage will be estimated; and other related aspects. In addition, it was necessary to make amendments to the current legislation and organisational arrangements.

Wildlife compensation programs are known to be used to mitigate conflict between humans and wildlife. This, being implemented to promote conservation of charismatic wildlife species, contributes to the tolerance and building of local support for participation in conservation effort. However, there is doubt regarding the long-term sustainability of compensation programs because they remain dependent and fully funded from outside sources. Therefore, in Kyrgyzstan still in use are the efforts to prevent damage and practicing predator control measures that applied in the Soviet times.

6.3 Predator control measures

There are many non-predatory species such as elephants for example, that require management action to alleviate or reduce their conflict with people. Therefore, wildlife damage management generally covers all cases and in recent decades has become an increasingly important part of the wildlife conservation (Vercauteren et al. 2010:232). But when the wildlife damage management is related to only wild predators it is usually termed as predator control and covers a complex of measures aimed at reducing populations of predators either to protect livestock or increase the population of game species.

By the late 1920s there was a growing tendency among scientists about the “indispensable” role of wild predators to the welfare of their prey species. From the biological point of view, it was considered that predators cull weak and unfit individuals in their respective habitats (Leopold, 1986:245). In this regard the wolf received the high attention of scholars in Europe and North America. Later in 1973, the first Working Meeting of Wolf Specialists met in Sweden and was followed by the first International Conference of the Wolf, sponsored by the IUCN. The wolf was recognised as a regulatory species and an important part of the health of ecosystems (Pimlott, 1975). Hunting of wolf is considered as a vital measure for the conservation of game species as

well as to protect livestock. For many years, wolves were categorised as “vermin”. Since 1928 they were subject to a government-financed and organised culling activity in the Soviet Union (Priklonsky, 1985:375). In addition, herders of state and collective farms were provided with firearms and hunting was centrally organised. Specially formed hunting brigades were working on wolf culling activities. All of them, in effect, were oriented to reduce the livestock losses due to wild predators, especially to wolves.

In contrast to snow leopards and brown bears, wolves are common in Central Asia and are considered a pest animal in many countries, where hunters receive financial incentives for culling them (Jumabay-Uulu et al. 2013; Lescureux, 2006).

Among wild predators, the wolf is a special beast with a long history of complex spiritual relationship with humans. Many indigenous people of North America became familiar with their behaviour and often regarded them supernaturally powerful and intelligent, and some tribes considered them as their protector. As well as in Eurasian cultures, the wolf appears in many legends such as the founding of Rome by the twins Romulus and Remus, and Anglo-Saxon nobles named themselves to be associated with admirable and respected characteristics of the animal (Fritts et al. 2003:291). The wolf was regarded as a totem by early Germanic people and warriors called *Ulfhednar.* However, in European understanding, the image of the wolf differed over time. Since the advent of Christianity, the image of the wolf changed in new ways of perception. Boitani (1995:7) notes that in that time ‘the Bible presents the perspective of people that lived in a hostile environment within a pastoralist economy’. The wolf became a symbol of human rapacity, wantonness, cunning, and deceit. Moreover, the wolf appears in a negative light in many ways of teaching moral lessons especially in folklore, such folk tales as “Little Red Riding Hood”, “The Wolf and the Seven Young Goat” or “The Three Little Pigs” (Fritts et al. 2003:293). However, since the rise of environmental concerns, the wolf has become again a symbol of undisturbed nature, and appears on the banners of many nature protection campaigns, particularly in Germany where it is considered a symbol of “lost nature” (Prof. Dr. H. Kreutzmann, personal communication, 2016).

In particular one Kyrgyz legend says that, in ancient times, the wolf and pastoralist were living in peace and in good neighbourhood. The wolf was never disturbing domestic animals and has a noble name – *börü*. One day the temptation overcame him and for the first time he tasted a livestock. Since then, it has made many troubles to the pastoralist and his name became

karyshkyr in Kyrgyz language[112]. It originates from a verb *oozu karyshsyn* and means verbatim a cramp of jaw muscles. The legend says that during this struggle with the wolf, brave nomads came up with a horse game *"Kök-börü"* (Grey wolf). This is a popular national game played on horseback and is known under the name of *Kök-börü* in Altai, *Kük-büre* in Bashkyr, *Kökpar* in Kazakh languages. The common name *Ulak* or *Ulak tartysh* (Goat pulling) is also used in Kyrgyzstan and is played as a national sport in many other countries of Central Asia. A similar game is known as *Buzkashi* (Goat pulling) in some countries. The headless carcass of a goat or calf should be lifted off from the ground or from another player and delivered to the goal place. Nowadays, the game *Kök-börü* has officially defined and adopted rules and played between two teams with a referee. The abovementioned legend is also reflected on the logo of the Kök-Börü Federation of the Kyrgyz Republic, where the horseman keeps the wolf above himself as a victory over the wolf (Fig. 6.3).

Figure 6.3 Official logo of the Kök-Börü Federation of the Kyrgyz Republic
Source: https://twitter.com/fedkokboru

A fur of a wolf symbolises honour and braveness of a hunter, even nowadays it can be found as a decoration inside of houses. However, in contrast to such images and legends, there is another acceptance of wolf by Kyrgyz people. For example, there is a clan bearing the name of wolf - *börü*. In addition, as well as other Turkic and Mongol people, a pre-Islamic Kyrgyz mythology was associated with the *Tengrism*. The core beings in Tengrism are *Kökö-Tengir* or *Tengir-Ata*, which is literally "Sky-Father" and Zher-Ene "Earth Mother" accordingly. It involves shamanism, animism, totemism and *arbak* worship – pray and beliefs on an ancestor's soul. And according to mythology, the origin of Turkic people is from the she-wolf and a boy who survived after battle. The image of a wolf's head in golden colour was displayed in many of their flags (Gumilev, 2003:12). Accordingly, this has made an ambivalent reputation of the wolf in the Kyrgyz culture.

[112] Personal talk with Dr. Orunbek Kolanov, Osh State University, Kyrgyzstan, 2015.

Nevertheless, due to livestock depredations caused by wolves, they were considered as a threat and actively hunted for many years.

Fritts et al. (2003:290) argue that the negative image of the wolf is deeply ingrained starting from the fairy tales and suggests it is related to the retention of negative experience in the psyche of many people. Moreover, additional negative perceptions come from the wolf's predation on livestock and pose an important security risk to humans. Among literature available in English, most reports of problem wolves originate from Russia and Finland. The wolf section prepared by N. Naumov in the "Mammals of the USSR" (1967) became available in English only in 1998 (Geist, 2007:21).

The first attempt of rehabilitation of this negative image in the Soviet Union was by Prof. Dr. D. Bibikov in the 1970s. He was co-chairman to the Wolf Specialist Group established in 1970 by the Species Survival Commission of IUCN. A highly reputable scientist-zoologist, Prof. Dr. D. Bibikov published several articles, and they were quickly grasped by the media. The wolf was widely popularised as "sanitar" (Lat. *sanitas* – health) or corpsman of nature (Rus. *Sanitar prirody*). Boreiko (2011:56) notes that this campaign was as unprecedented in its courage and scale of experiment. In 1978, under the facilitation of Prof. Dr. Bibikov there was a round table organised by the Journal "Hunting and Hunting Economy", where he was an opponent to wide ranging wolf culling. Shortly thereafter in 1983, under his initiative, the Soviet Academy of Science established the Wolf Working Commission. In the beginning the commission faced strong resistance especially from the hunting community and hunting organisations. The outcome report prepared by the commission highlighted that funds that the state spends to contend with wolves was not generating desirable results. Nevertheless, consensus about harm to nature from the use of poisons was found. Actual economic damage to animal husbandry due to wolves was estimated as scanty in comparison to other reasons. In the end, the commission firstly proposed to change the "vermin" status of wolf to "game species". Secondly, it distinguished territories into different categories of wolf population management starting from regulatory harvest in central parts up to abolition of hunting in sparsely inhabited areas of the Soviet Union (Boreiko, 2011:59). In 1985, the book "Volki. Proiskhozhdenie, sistematika, morphologiya, ekologiya (Wolves. Origins, systematisation, morphology, ecology) was published in Moscow by the Soviet Academy of Science under the editorship of Prof. Dr. D. Bibikov. The book was an attempt to better understand the ecology of the wolf and discuss various aspects of wolf management.

Errington (1945:108) notes that '… the physical prowess and intelligence of wolves, their selectiveness and ways of "sport-killing," make them, among predators, probably inferior only to

man, himself, in potentialities for destroying immense numbers of comparatively slow-breeding big game'. Therefore, traditionally, wolves have been considered as a competitor for wild ungulates, which are the hunter's valued game species.

Nowadays in entire Osh oblast, roe deer is remained only in the Alai. On my own counting, they are up to thirty, from them this winter wolves killed six. In 1976 when I started my hunting profession, here [Kün-Elek canyon] annually, I was counting around sixty heads of roe deer, now I have seen only seven. I am protecting them from two enemies, from the wolves and poachers

Üsön Shamshiev (born in 1951), hunter, Kün-Elek Village, 2015

Large predators such as wolves are an important keystone species and considered as mortality drivers of wild ungulate populations. It is known that wolves maintain the health of ungulates through the removal of weak and unhealthy animals (Haswell, 2019:14). Predator control measures may be occasional such as a farmer shooting a predator in an attempt to protect livestock or regularly, due to harvest because of the availability of bounty programs in the country (Sillero-Zubiri and Switzer, 2004).

In the past, the use of eagles, trapping (Kyr. and Rus. *Kapkan*) and dogs were common in commercial hunting practices especially on wolves and foxes in socialist Kyrgyzstan. Since the introduction of centrally organised predator control activities, the use of eagles and its contribution has significantly decreased by 1970s. Moreover, the eagle species as well as other raptor birds received protected status in 1975 (Beishebaev et al. 1985:45). Nevertheless, there are still practitioners in the country hunting with eagle and is appreciated as cultural heritage. Since adoption of the Government Decree No. 143 on 23 March 2015 about "Hunting Rules in the Territory of the Kyrgyz Republic", it has become possible to legalise this type of hunting. The birds of prey can be caught and trained after obtaining permission from the State Agency on Environmental Protection and Forestry. According to the Department of Protection and Use of Natural Resources (2019) there are around 200 eaglemen (Kyr. *Bürkütchü,* Rus*. Berkutchi*)[113] in the country, however, only half of them are registered and have received a ''Passport of Hunting Bird''.

It is known that maternal sense of wolves is strong. There are many noted cases when a hunter who has taken away wolf pups from a den was followed by a she-wolf into a village (Heptner et

[113] Generally, a man who is training the hunting birds called as *Munushker* in Kyrgyz language. This term is also known in Russian literature. A hunter who works with other birds of prey such falcons referred as *Kushchu.*

al. 1967:182). Therefore, many pastoralists are afraid to bother a wolf's den and believe that later wolves will retaliate to them.

Not far from my livestock shelter, there is den of wolves. People call them that they are my wolves. Because I do not touch them, they do not touch me. Wolves are very clever beasts, they know if I face a threat from them, I can take an action. They go to other places for hunting

Esengeldi Abylaev (born in 1980), Kara-Kabak village 2015

According to Rukovsky (1985:334), in the Baltics and Ukraine the main prey of wolves is roe deer, in Belorussia and along the delta of main rivers it is wild boar, and in the steppes of Kazakhstan – saiga antelope (*Saiga tatarica*). While in Kyrgyzstan, it is a combination of red deer, wild boar, argali, ibex, marmots and domestic animals (Vyrypaev and Vorobyov, 1983:50).

The most recent, comprehensive national status report about wolves was in the late 1970s. Wildlife researchers Vyrypaev and Vorobyov (1983) updated the biology of wolves, management status, showing population estimates and harvest rates in Kyrgyzstan. Since the collapse of the Soviet Union, further updates and systematic records about economic damage caused by the wolves are not available, except for unpublished material by the State Agency on Environmental Protection and Forestry. The agency together with the Kyrgyz National Academy of Science estimates the wildlife population and defines the hunting limit of the game species. In Kyrgyzstan according to the latest data, the wolf population is around 3,500-4,000 (State Agency on Environmental Protection and Forestry, 2019) almost similar to the estimates of 3,200-3,900 in the 1980s by Vyrypaev and Vorobyov (1983:23).

In the Soviet Union, the population of the wolf has fluctuated considerably. By the end of World War II, the number of wolves increased two times and was estimated at 150-200 thousand animals. With the growth of the wolf population, the depredation on livestock and game species also increased. In 1946, as a result of measures taken by the state, 62,700 wolves were culled. For the next 15 years an annual harvest was maintained at the level of 40-50 thousand. Later the number of wolves culled decreased to 15 thousand per year (Bibikov, 1975:29-31). In the 1960s in Central Asia (except Kazakhstan) the annual harvest was around 1,500-2,000 wolves. According to Bibikov et al. (1985:457) this was not leading to the wolves' population decline, which was around of 6-8 thousand.

Priklonsky (1985:377) stated that the increase in wolf population primarily effects livestock depredation rather than wild prey. In the past, the wolves were harvested in much higher numbers (Fig. 6.4) in comparison to nowadays. Since the 1960s the harvest declined from a high of 4,588 in 1956-1960 to 1,450 in 1991-1995.

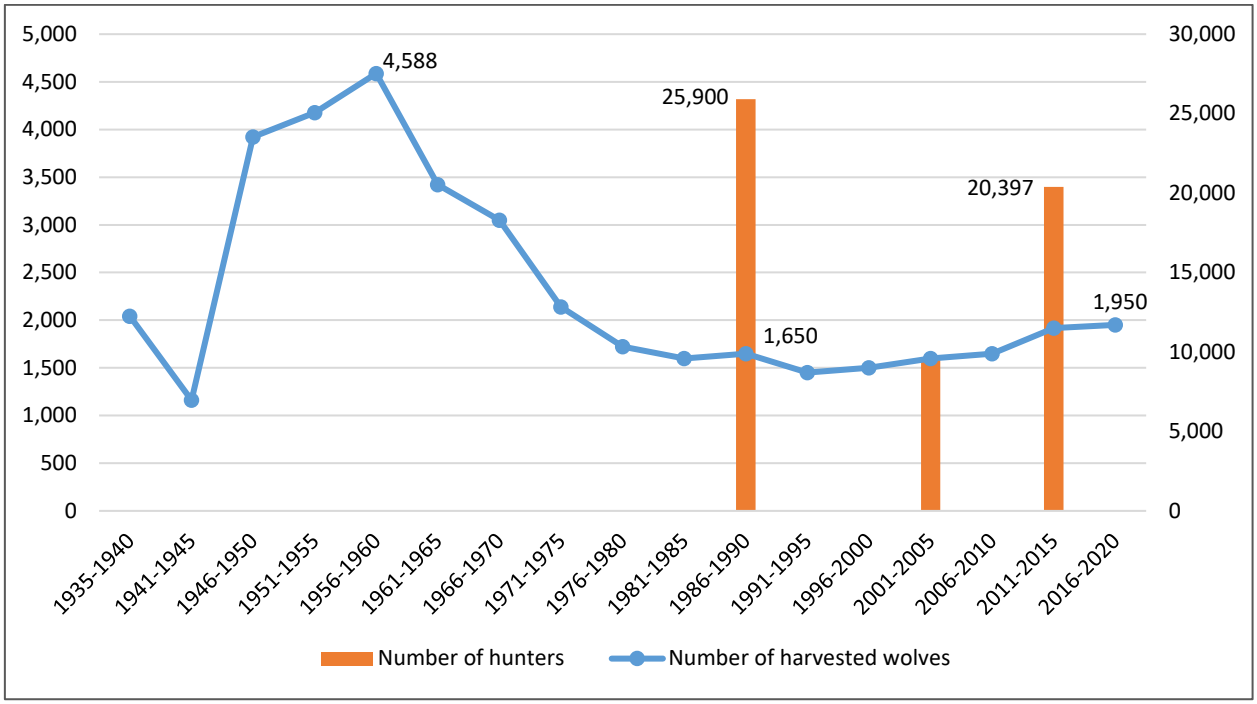

Figure 6.4 The number of harvested wolves in Kyrgyzstan
Source: Compilation based on Vyrypaev, 1985:510 [1935-1980], unpublished reports of the State Agency on Environmental Protection and Forestry, 2011 [1981-1991] and 2021 [1992-2020]

In Kyrgyzstan, according to Bibikov et al. (1985:460), by the 1980s the wolf issue was minimal which is also reflected on the diagram showing a decline in wolf harvest. Some scholars noted that the decrease of hunting pressure on wolves occurred after the independence of Kyrgyzstan (Lescureux and Linnell, 2013:7). However, according to diagram above, there is little correlation with the membership number of the hunting association and the number of wolves harvested in the country. Because nowadays registration as a hunter provides a legal base to buy and own a rifle. This opportunity increased the number of so to speak hunters but indeed only rifle owners since 2000s. Therefore, there is a change in quality and characteristics of the officially registered hunters of today. In socialist Kyrgyzstan, hunter was a job and profession linked and integrated with the centrally planned socialist economy.

Throughout Kyrgyzstan, two predatory species, wolves and jackals, are classified as game species which can be hunted without limits. They can be hunted without restrictions by officially registered local hunters according to the Hunting Rules in the Territory of the Kyrgyz Republic, adopted by the Government Decree No. 143 from 23 March 2015. International hunters require a license to hunt wolves. Moreover, wolves cannot be hunted within Protected Areas. The hunting season for wolves is year-round, nevertheless most of the harvest occurs in winter and it is classified as a good furbearer species.

Livestock depredation by wolves occurs wherever they share same habitat with pastoralists. Therefore, the wolf predation on livestock is an acute issue for many areas where pastoralism plays a crucial role for livelihood. During spring and summer, the domestic animals are less disturbed by wolves. My field surveys also confirm that most of the predation on livestock is taking place during winter. Even in the web portal of the news agency AKIpress, there is a special news block[114] "The wolf season". Most of the posts concerning wolf attacks or killing (hunting) them are dated in December-April months of the year.

In 1989 our sovkhoz had over 76 thousand thoroughbred sheep, 250 horses, around two thousand milking cows. Nowadays livestock numbers much low. In comparison to the past, pastures much better. To increase our livestock, we should protect them from disease and wolves.

Sulaiman Töröbekov (born in 1950) former sovkhoz veterinarian, Kara-Kabak village, 2015

In fact, nowadays, sheep numbers are radically low in contrast to the 1980s. According to the Kashka-Suu Pasture Committee, by 2020, there were 31,310 sheep and goats, 4,870 cattle, 1,900 horses and one camel. People have increased the number of cows, and horse numbers have increased by 3.5 times.

In the Soviet times various predators control measures were used. Animal poisoning was widely applied in the early twentieth century and *strychnine* was used as a pesticide. In the past, this highly toxic and colourless poison was used with baits against wolves, and later it was replaced with *barium fluoroacetate* (Boreiko, 2011:21). Poisons are not specific or selective to such unwanted pests and may kill other wildlife in the food chain including birds, as well as an endangered species.

In accordance to the "Hunting Rules in the Territory of the Kyrgyz Republic" adopted by Decree of the Government of the Kyrgyz Republic No. 143 enforced on 23 March 2015, the use of helicopters, motor transport and snowmobiles are prohibited. As well, as the application of poisons, explosives, hooks, glue, and traps not bigger than number three, are not allowed.

Many respondents recall the Soviet time, when herders had rifles to combat wild predators.

Before we had rifles to protect our livestock. Nowadays, it is very expensive to buy and maintain. Moreover, there are many required papers, such licence, special metal box to keep gun and et. Hunters cannot always accompany us. When it is needed, we invite them, they come, roam 1-2 days and go back. The Government should help us to get rifle.

[114] http://www.turmush.kg/ru/event:5

Erali Myrzakanov (born in 1980), Kashka-Suu village, 2015

As it was mentioned above, to prevent livestock losses to wild predators, the kolkhozes and sovkhozes provided their herders with hunting weapons and supplies. However, in July 1990, due to an ethnic conflict known as the "Osh riots",[115] the Government of the Kyrgyz SSR decided to seize the weapons and many of them were collected by the police. By September 1990, 1,453 firearms were voluntarily handed over and 195 firearms seized with 2,101 patrons (cartridges). But at the same time, 13 rifled firearms with 2,640 patrons and four Kalashnikovs were lost and 376 firearms were still wanted [116]. Up to now, there are still many illegal rifles in the hands of pastoralists, which was always a concern of wildlife conservationists. They hide and use them in secret, away from prying eyes, but occasionally being confiscated. Annually the State Agency on Environmental Protection and Forestry seizes around 40 firearms. For instance, according to the unpublished report in 2012, 36 firearms (11 rifles and 24 smoothbore weapons and one combined firearm) were confiscated from the poachers, where among them, 23 were without documents and handed to the police. In 2019, among 38 confiscated firearms, 30 were without documents and handed to the police as well (State Agency on Environmental Protection and Forestry, 2020).

An increase in the number of complains about wild predators may also be linked with the number of "complainers" represented by pastoralists. In the Soviet times there were only 470 sovkhozes and kolkhozes that were dissolved by 1996 (Abdurashitov, 2015:19). Nowadays, according to the national report of the Kyrgyz Statistical Committee (2017:53), there are 401,350 individual farming entities in agriculture, who between them, own almost all livestock in the country (Fig. 6.5). Therefore, the Department of Protection and Use of Natural Resources under the State Agency on Environmental Protection and Forestry argues that livestock protection from wild predators is not their direct obligation as it was in Socialist era.

In the Soviet time Government was protecting the "state property", nowadays almost all livestock is privately owned. Therefore, every owner should take care of them by themselves. People still not yet wean from the past.

Almaz Musaev, Director of the Department of Protection and Use of Natural Resources,
State Agency on Environmental Protection and Forestry, 2016

[115] The Osh riots (1990) is the first ethnic conflict between Kyrgyz and Uzbeks that resulted in around one thousand people killed. The violence began on 4 June 1990 in the city of Osh and started to spread to other areas of the Osh oblast.

[116] The Government Decree of the Kyrgyz SSR from the 18 September 1990 No. 274 about Measures to Implement the Decree of the President of the USSR of July 25, 1990 "On the prohibition of the creation of armed formations not provided for by the legislation of the USSR and the seizure of arms in the event of their unlawful possession".

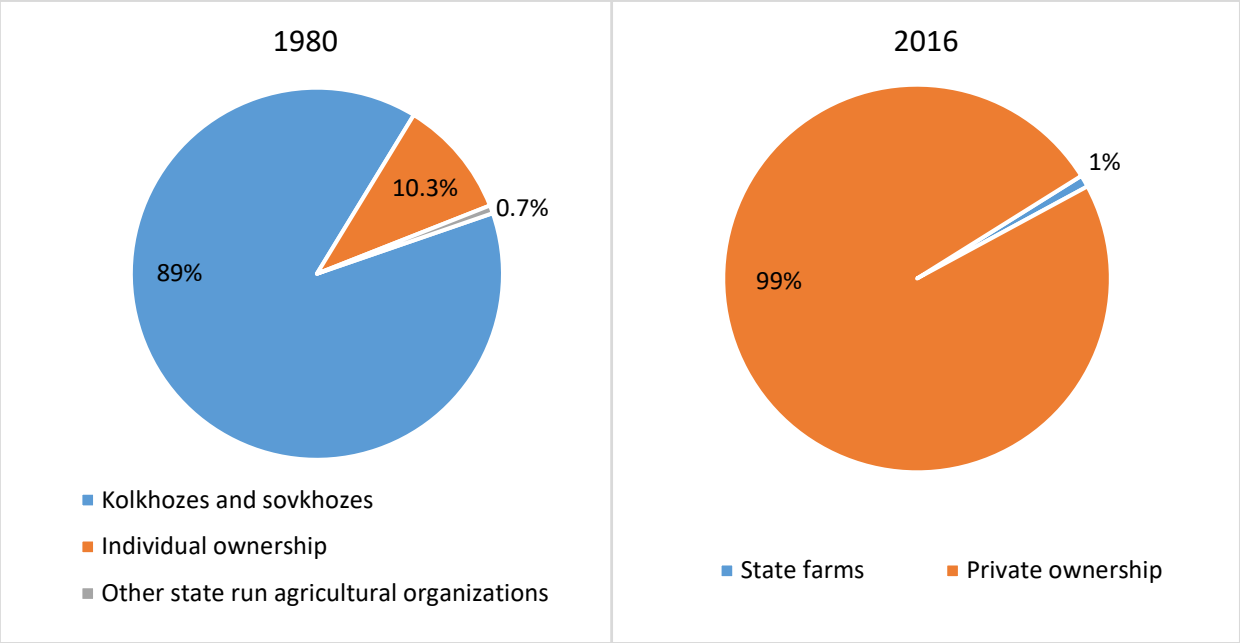

Figure 6.5 The share of livestock ownership in Kyrgyzstan

Source: Compilation based on Central Department for Statistics Kyrgyz SSR, 1981:146 and NatStatCom, 2017:53-54

Nevertheless, due to the high number of complaints from pastoralists in 2011, the Kyrgyz Government adopted the Decree about providing support to regulate wolf and jackal numbers[117]. Accordingly, the Department of Protection and Use of Natural Resources organised regional hunting brigades (Table 6.3) and has bounty payments of 6,000 KGS (85 USD) for wolf, 1,500 KGS (20 USD) for a wolfling and 2,000 KGS (28 USD) for a jackal.

In addition to this payment, there is co-financing from the local municipalities to the amount of 5,000 KGS for a wolf and 3,000 KGS for a jackal. Accordingly, in 2017 there were 528 wolves and 1,306 jackals killed in total. Most of the wolves were harvested by specially organised wolf-hunters.

Table 6.3 The number of organised hunting brigades and harvested predators in 2017

Divisions	Hunting brigades formed from the State Agency staff			Brigade of wolf-hunters			Individual hunters		
	number	harvested		number	harvested		number	harvested	
		wolf	jackal		wolf	jackal		wolf	jackal
Chüi	9	5	81	6	24	76			

[117] Government Decree No. 703 from 4 November 2011 about amending the Decree of the Government of the Kyrgyz Republic "On state support for measures to regulate the number of wolves and jackals" dated September 2, 1997 No. 509.

Talas	8	6	29	6	40	116			
Naryn	6	5	9	38	165	194			
Yssyk-Köl	5		5	9	84	64			
Osh	10	13	47	9	21	54	21	58	95
Zhalal-Abad	9	8	40				40	34	442
Batken	3	30	20	3	35	34			
In total	50	67	231	71	369	538	61	92	537

Source: Based on unpublished report of the State Agency on Environmental Protection and Forestry, 2018

From the beginning of spring, wolves shift mainly to the marmots after their hibernation period. Almost from the beginning of March, marmots are already waking up. From May-June the wolf preys on smaller domestic animals, usually horse offspring if they left unattended.

In many developed countries there are specially designed compensation schemes for wildlife damage. This way of creating tolerance and as a conflict mitigation tool is dominantly in use in regarding to large wildlife. Such compensation programs have also been introduced in some developing countries and mainly financed by International NGOs. Which means it is mostly dependant on external funds or sponsor organisations. Accordingly, the effectiveness of compensation schemes and their sustainability is widely debated. Nevertheless, there were attempts by some NGOs to introduce it in Kyrgyzstan. But, because of the complexity of implementation and the different approaches between interested parties, there is no such compensation program yet. The government is implementing the predator control activities that were in practice in the past but with some modifications. The wildlife conservation projects working in the country, promote other so-called non-lethal predator control measures.

6.4 Prevention of livestock depredation

Livestock guard dogs have been used for centuries to protect livestock from wild predators and many breeds originated from the mountain regions of Europe and Asia (Wilbanks, 1995:162). In the regions such the Carpathian Mountains, the Iberian Peninsula, the Balkans, central Italy and Central Asia, where large predators persisted, the guard dogs were a traditional and an integral part of pastoralism (Linnell and Lescureux, 2015:21). For instance, American livestock producers began using guard dogs in the mid-1970s (Andelt, 1992:55). A resurgence of this ancient form of livestock protection happened when toxicants were banned in the USA (Green and Woodruff, 1996:5) and among other non-lethal predator control measures the use of guard dogs received

considerable attention by many farmers and researchers (Wilbanks, 1995:162). The methodology of socialisation and guidance on use is described by Green and Woodruff (1996).

Nowadays, there are around 50 breeds that are recognised by the Fédération Cynologique Internationale (FCI)[118] and the American Kennel Club (AKC)[119]. The more common breeds include the Kangal Shepherds, Great Pyrenees, Kuvasz, Maremma, Sharplanina, Karakachan, Carpathian, Caucasian, Tibetan Mastiff and other mountain shepherd dogs (Linnell and Lescureux, 2015:16). In contrast to the herding dogs which are used to control the movement of livestock, the guard dogs are massive and taller at the shoulder.

In Kyrgyzstan there are two main aboriginal dog breeds locally called *Döböt* and *Taigan*. The Kyrgyz *Döböt* is a livestock guard shepherd dog that is well adapted to the high altitudes and harsh climate accordingly. The name consists from two words, *döbö* – hill and *it* – dog in Kyrgyz language, which can be translated as "mountain dog". In other parts of Central Asia this dog is also known as *Alabai* in Turkmenistan, *Töbet* in Kazakhstan and *Aziat* in Russia. During the Soviet time this breed was registered under the name of the *Sredneaziatskaya ovcharka* (the Central Asia Shepherd Dog), which is recognised by the Fédération Cynologique Internationale and the American Kennel Club. Despite the fact that one breed can have several local names and be distributed over a wide range, some specialists distinguish them within borders of countries and geoclimatic zones (Linnell and Lescureux, 2015).

The Central Asia Shepherd Dog is considered one of the most ancient breeds of the dogs. The selection and standardisation work started in the Soviet Union in the 1930s. They were formed as a breed from natural selection during more than four thousand years in the vast territory of Central Asia. The dogs were mainly used to protect livestock and exposed to rigid natural selection. Hard living conditions and constant struggle against predators have influenced the shape as well as the dog's character and it has made it strong, fearless, and taught to save its energy. After dissolution of the Soviet Union, the breed remains under the patronage of Russia (Fédération Cynologique Internationale, 2011). According to Ivanova (2007) the Central Asian Shepherd dogs can come from working lines, fighting lines, and livestock guardian lines, and behave accordingly, regardless of the country they come from.

[118] FCI - the Fédération Cynologique Internationale is the World Canine Organisation established in 1911. The aim is to promote and protect cynology and purebred dogs worldwide. It includes 98 members and contract partners (one member per country) and each issues their own pedigrees and trains their own judges. See http://www.fci.be/en/

[119] AKC – the American Kennel Club, founded in 1884 is the recognized and trusted expert in breed, health, and training information for dogs. See https://www.akc.org/

The well trained and pure breed of shepherd dog locally called *Börübasar* in Kyrgyz and *Volkodav* in Russian languages means wolfhound. As a rule, dogs as puppies are placed together with the livestock in order to secure a close bond between them (Wilbanks, 1995:163). Accordingly, dogs stay with livestock without harming them and their protective behaviour is mainly instinctive (Green and Woodruff, 1996:6). It is believed that a couple of good dogs can ward off or fight with a predator.

> Population of wolves is increased. Because of wolves I have to keep 3-4 good dogs. They are not cheap… I need to feed them as well. It is an extra work, and an extra food
>
> Arapbai Turdumamatov (born in 1960), Achyk-Suu village, 2015

Except feeding, the cost of a guard dog includes also veterinary care. The price of a livestock guard dog in Kyrgyzstan varies from place to place. As a rule, pastoralists are choosing the pup based on physical characteristics and performance of the parents. For instance, in the Alai the barter price of the pup of good guarding dogs is one sheep. An average lifespan of a dog is estimated as 10-12 years (Wilbanks, 1995:163), however many of them live much shorter due to injuries from fighting with predators such as wolves, or from accidents during the seasonal movement of livestock.

The *Taigan* is a sighthound dog perfectly adapted to work in the mountains. Different from many other countries, historically live coursing of game has been legal in the Soviet Union. It was traditionally used by many hunters for coursing a game as well as in combination with the trained golden eagle (*Aquila chrysaetos)*. In the past, the Soviet cynologists began to record the existing specimens in Kyrgyzstan since 1930s. According to Shereshevsky (1953:40) by the 1950s there were around one thousand dogs of this breed in the hands of hunters. The first standards of the dog were elaborated in 1964 and registered as "*Kirgizskaya borzaya taigan"* (the Kyrgyzian Sighthound Taigan) within the Soviet Union. Later in 1995 the standards were adopted by the Cynologist Council of the Kyrgyz Republic, as the individual breed had not yet been listed by the FCI. However, many countries including Germany have recognized the Taigan on a national level (Verband für das Deutsche Hundewesen, 2014).

Since the dissolution of the collective and state farms, for many people in the rural areas of Kyrgyzstan, hunting became an occupation and income source for living, and there is high interest in this breed. Moreover, some urban upper-class people have discovered the Taigan as a

prestigious symbol and the dog regularly started to appear in many national events. It is believed that a good Taigan breed dog can attack a wolf and keep them away from the flock.

> Nowadays many people talk about the Taigan dogs [for livestock protection]. But it is different breed, it is not a shepherd dog, it is a hunting dog. The dog needs special training and moreover the dog is expensive
> Akylbek Nadyrov (born in 1979), Kashka-Suu village, 2015

In areas of mobile pastoralism the application of electric fences is limited by the maintenance required, and in winter, especially, depth snowfall, but has good potential to protect apiaries. Many authors wrote about the use of donkeys and llamas in North America and Germany to protect sheep from wild predators (Andelt, 1995; Stone, 2016:17; Wilbanks, 1995:163; Woodroffe et al. 2005). It is considered that the characters of these animals and noise that they make drive away predators. However, in regard to Kyrgyzstan, it is the reverse, where the donkeys are considered as attractant for predators. Therefore, for example in the late autumn of 2014, the head of the Pasture Committee of the Kashka-Suu municipality collected 48 wandering ownerless donkeys within the villages. With help of two hunters that were invited, all donkeys were shot and buried outside of the settlement. Besides using guarding dogs and properly constructed livestock shelters, pastoralists are advised to apply animal repellent tools such sensor flashing lights during the night. It can be used effectively in areas where lights are few. But it is known that after some time, large predators will get used to the lights. Therefore, the best way to avoid livestock depredation is to apply combination of all available preventive non-lethal measures.

6.5 Wolf attacks on humans

The most dramatic form of wildlife-human conflict is injury or the lethal ending of people. This causes a negative attitude by the public toward large predator conservation, creating additional challenges for wildlife management (Støen et al. 2018).

According to Article 23 of the Law on the Animal World (1999) of the Kyrgyz Republic, “Regulation of the number of wildlife” allows the regulation of overabundant species which may threaten public health concerns. It also says that the regulation of the number of individual objects of the animal world should be carried out in ways that exclude harm to other objects of the animal world. Objects of the animal world, the number of which is subject to regulation, as well as the procedure for carrying out relevant activities, are determined by the Government of the Kyrgyz Republic.

All mammals are susceptible to the rabies infection (Box 6.1). However more capable rabies reservoir species are found in the Canidae families such as dogs, wolves, foxes, coyotes, jackals and Chiroptera order species such bats (Hanlon et al. 2007:203). In wild nature the wolves frequently suffer from rabies. As a result, most cases of wolf attack on humans are associated with rabies. Though, according to Heptner et al. (1967:183) studies in the 1960s found that among cases of rabies infections in the Soviet Union, wolves were responsible for up to 2-3%, while the dominant portion belonged to domestic dogs, 70-88%, and cats, 6-8% accordingly. Nowadays, based on registered cases in Kyrgyzstan between 2002-2011, among a total of 867 animals with the disease (Zhunushov, 2011:9), wolves constituted 2%, dogs 58%, livestock 35% and rodents 1%. The share of wolves is the same as foxes, 2%, and domestic cats 2%. The situation regarding wolves is not radically changed, while the share of domestic animals remains as the major source. An increase of diseases among livestock, mainly cattle, can be explained as due to privatisation of the agricultural sector of the economy of Kyrgyzstan, resulting in a weakening of the vaccination measures of veterinarian services.

As a prophylactic measure of rabies, besides culling of wolves and jackals, the Department of Protection and Use of Natural Resources under the State Agency on Environmental Protection and Forestry annually culls stray dogs and cats. In 2015, for instance, 8,317 dogs and 40 cats were culled. In addition to this they cull some 3,000 birds labelled as “pest” including ravens, magpie (*Pica pica*) and Common myna (*Acridotheres tristis*).

Box 6.1 Rabies

Rabies disease is a highly neurotropic virus causing a fatal inflammation of the brain and spinal cord termed as encephalomyelitis. It belongs to the prototype virus of the genus *Lyssavirus* which originates from the Greek language meaning “rage” (Wunner, 2007:23), while the Latin word *rabies* means “to do violence” (Jackson, 2014:601).

Generally, most human rabies cases are transmitted by rabid dogs, but since discovering the European and Australian bat lyssaviruses the situation has changed. Even in the developed world where canine rabies has been reduced to almost nil, the number of reported infection cases from bats has increased.

In the wild nature, wolves suffer from rabies and wolf attacks on humans mainly occur from a sick animal. Though, there is almost no case registered with resulting fatality. Despite that fact that more people are affected by species such as domestic dogs, horses, cattle, or reptiles, the

attitudes of people towards large wild predators reflect their concerns about personal safety. Rareness of attacks also generates much media attention (Støen et al. 2018).

During the period 2005-2020, based on messages in the mass media, it was possible to record 25 publicly known incidences of wolf attack on humans in Kyrgyzstan (*Fig. 6.6*). From them, 28% of attacks by wolves with rabies was confirmed by laboratory analyses. The most cases happened in 2015 and 2017, eight and seven attacks accordingly.

Within a reasonable period after rabies exposure, an infection can be prevented by post-exposure vaccination (Lafon, 2007:489). Therefore, in modern time, almost no case is registered with a resulting fatality, at least when the vaccine is administered to patients in time.

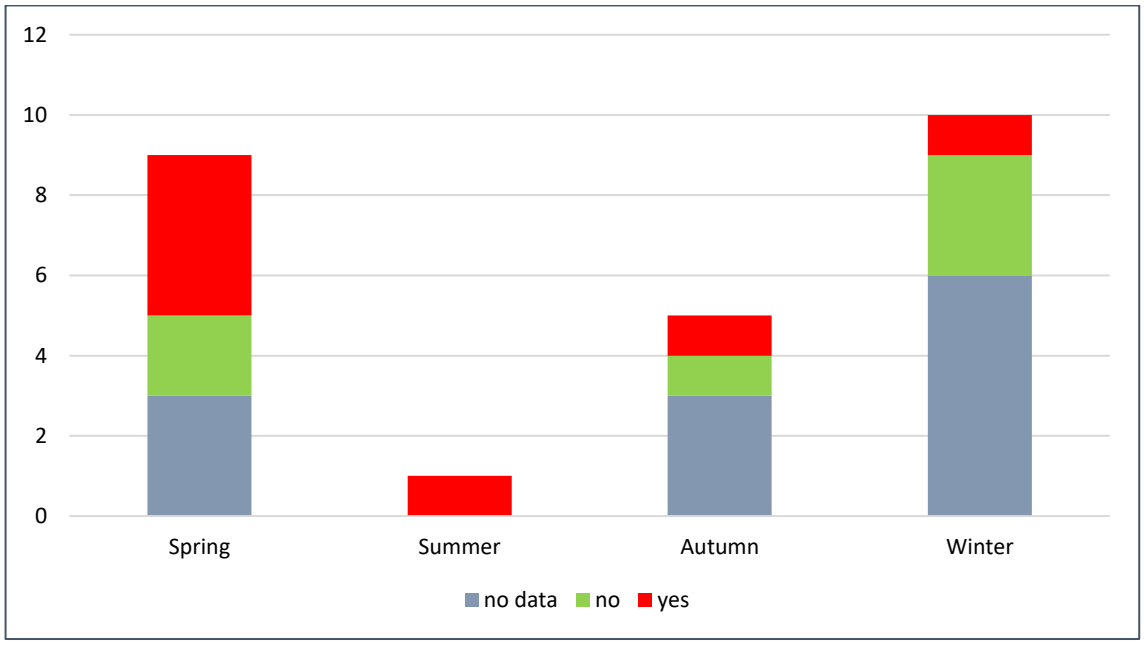

Figure 6.6 Wolf attacks on humans in Kyrgyzstan
Source: Compilation based on messages in local mass media, 2005-2020 years

Annually, the Ministry of Health of Kyrgyzstan prepares around 40 thousand vaccines and up to ten litres of rabies *immunoglobulin* (RIG), which is used for post-exposure prophylaxis. These medications are distributed among all districts of the republic.

The total 25 cases were categorised as “predatory”, “sudden encounter” and food conditioning and habituation”. Fourteen cases (56%) were found as “predatory”, while it happened when the main aim of the wolf was a livestock that associated with such “the wolf entered to livestock shelter”, “during livestock herding” or “dog was attacked and man was helping to his dog” and etc. Ten cases (40%) were classified as “sudden encounter”, where the attacks happened mainly when “the wolf approached human on the road, when he was repairing a car” or “humans confused the wolf with a dog and were bitten”. Most of the rabies confirmed wolf attacks on

humans belong to this latter group. One case corresponds to “food conditioning and habituation”. This accident took place in the territory of the Kumtor gold mine in Yssyk-Köl oblast. On 28 May 2013 the wolf attacked two workers. It is known that there are over 2,600 workers employed to run the mine. Waste from the kitchen was deposited in an open space with relatively weak fencing. Accordingly, the place of waste disposal attracted wild predators and many birds, especially ravens. In addition, drivers were often feeding wolves on the way. As a result, *t*he pack of wolves had become habituated and then, apparently, food-conditioned to the camping ground. Since that case, the mine administration, after consultation with the Biology Institute of the Kyrgyz National Academy of Science, introduced restrictions regarding the feeding of wild animals by workers. The security service of the mine was ordered to regularly patrol the territory and even use noise cartridges.

Nevertheless, despite wolf attacks on humans, there are strong advocates for wolf conservation. Generally, the role of the wolf as a regulatory species and its significance for the health of ecosystems is emphasised by many local and international wildlife conservationists. They give as an example cases of wolf extirpation in USA and Western Europe, which caused an overabundance of wild ungulates. Accordingly, this resulted in degradation of the vegetation in many places. However, in the territories of former Soviet Union, wolves never were extirpated in their habitats, but regulatory culled.

7 From conflict to coexistence – negotiating a balanced approach

The previous discussion on the strategies used by agriculturists, pastoralists and nature protectors on the relationship between humans and wildlife have highlighted the areas of competition and conflict in the Alai Valley specifically. Besides the expansion of infrastructure and settlements, nature protection and wildlife management are mainly challenged by on-going pastoral practices. The degree of pastoral intensification and spatial exploitation is one trigger in this nexus that has experienced a significant transformation over time.

The analysis of the pastoralist-predator nexus was embedded in an appreciation of economic developments and political interventions that have transformed the human response to environmental challenges and the exploitations of natural resources.

The shrinking of pristine space and the expansion of human intervention is strongly related to historical-political periods that have to be addressed as the pre-Soviet, Soviet and post-Soviet era. It shows that the two revolutionary transformations of the twentieth century have been instrumental for significant changes in power structures, socio-economic systems and human action that have shaped the human-environmental relationship.

In conclusion, these phases and their effect on the Alai Valley are finally discussed and illustrated in Figures 7.1 to 7.3.

Over time, it has been viewed as competition between humans and wildlife for space and food resources. Human activities such as pastoralism and resource extraction are considered as the main threats to wildlife, especially to large predator species through direct persecution. However, some species appear to adapt and even thrive in an anthropogenic environment. Therefore, understanding the settlement process and historical development of present-day villages in the Alai Valley are essential in understanding the spatial utilisation of the territory, particularly in the case of how the development process of the settlements have altered the human-wildlife interrelation.

7.1 Space for human and wildlife

Prior to the Soviet era, the Alai Valley was used by Kyrgyz pastoralists mainly as summer grazing areas. Except for the two outposts for keeping personnel in the Daroot-Korgon and the Erkechtam around former *Rabat*[120] areas, the vast area was open to seasonal visits by pastoralists

[120] *Rabat* – usually building made out of stones, previously used by caravans during the prosperity of the Great Silk Road. The term originates from Arabic word *Ribaat* which means post, or stone house, as a rule a small checkpoint or fortress is built along a frontier during early Muslim conquest. Rabats later served as connecting points as well as

and their herds (Luknitsky, 1955). They used the western part of the valley and due to its lower altitude, it was possible for pastoralists to stay even over winter in this area (Fig. 7.1). Significant space in the Alai and Chong-Alai Ranges was left to wildlife. Communication took place along the floor of the main valley.

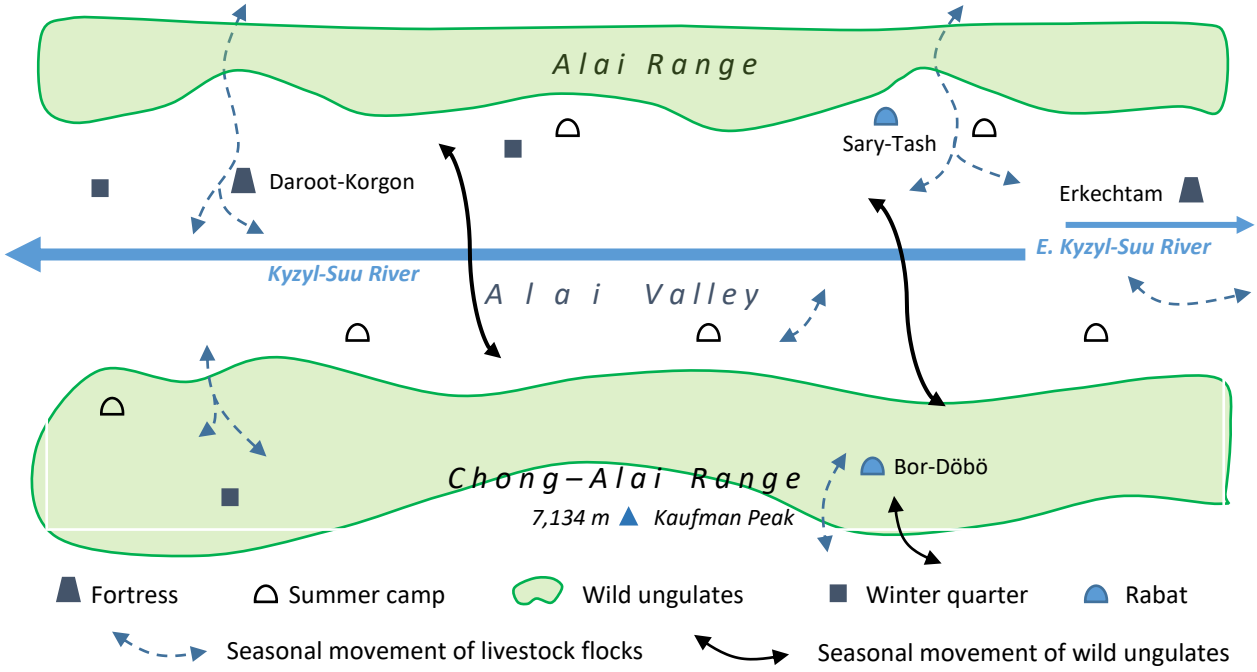

Figure 7.1 Settlement pattern in the Alai Valley at the beginning of 1900
Source: Own design based on Beletsky, 2013; Kuznetsov, 1948; Leonov, 1951

The number of villages and permanent population increased rapidly with the establishment of Soviet authority after 1932. Settlements are located dominantly alongside the Kyzyl-Suu River, except Chak and Zhash-Tilek villages which are in the Kök-Suu canyon in the western part of the Alai Valley (Fig. 7.2). New settlements are located mainly on the right bank of the main river or in other words on the *Küngöi* side – sun exposition part of the Alai Valley. Societal transformations, collectivisation and forced sedentarisation in the socialist period of Kyrgyzstan changed the mobile pastoral practices throughout the country into detached mountain pastoralism (Kreutzmann, 2011:207-208). Livestock flocks stay over winter at the permanent settlements in high-altitude pastures and move back to the summer pastures from a relatively short distance.

to protect trading routes within the Silk Road in Central Asia. Rabat is often near passes, that is why robot/rabot means pass as well, for instance *Kyzyl-Rabat* that is situated in Gorno-Badakhshan of Tajikistan. In Kyrgyzstan, the famous one is *Tash-Rabat* located in Naryn oblast.

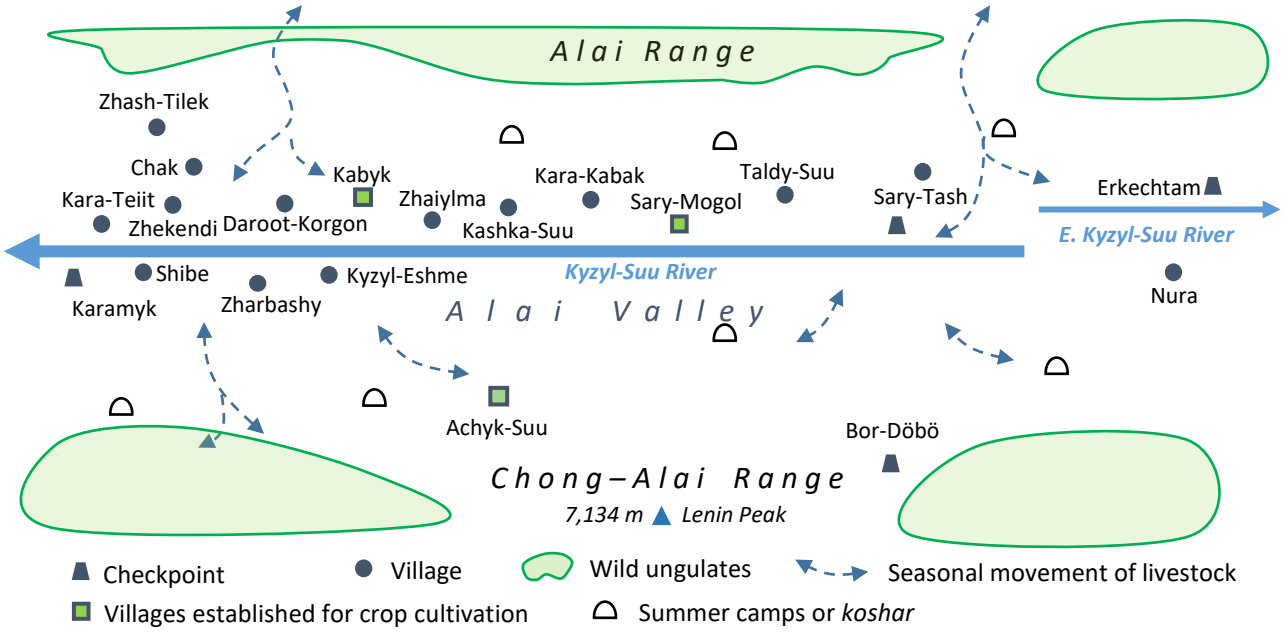

Figure 7.2 Settlement expansion in the Alai Valley after 1930s
Source: Own design based on Fedosenko, 2000; Kuznetsov, 1948; Yanushevich et al. 1972

During the Soviet period the expansion of settlement can be divided into two main phases. The first and main phase took place between 1930 and 1950 in the form of a sedentarisation campaign and collectivisation accompanied by land-water reforms. The second period began after 1950 and continued up to 1980, which was associated with the intensification of the agricultural sector, by establishing new settlements specialised in fodder cropping, for example at Kabyk village. The central government increased the country's agricultural production through mechanisation, construction of irrigation channels, melioration works, application of fertilizers and introduction of high-yield crop varieties. Pastoralists were provided with necessary medical, cultural and educational facilities, infrastructure and services. Under the Soviet style modernisation concept, the command economy regulated all kinds of exchange, goods supply, market, and subsidies.

Within the collective farms, agriculture was based on communal socialist ownership and the socialist model of animal husbandry significantly changed the former lifestyle of pastoralists. Livestock shelters, locally *koshar* or *koroo* were built as winter shelter for livestock and a large number of livestock remained in the highland pastures year-round. In the middle of the 1960s, the number of sheep reached over 8 million, cattle and horses, over 880 thousand and 200 thousand respectively (Fedosenko, 2000:109). Pastures in the Alai, Arpa, Aksai highland valleys and upper streams of Sary-Zhaz River basin were intensively grazed by livestock. With increased pressure from intensive pastoralism, the wild ungulates have declined due to habitat loss and

from diseases associated with domestic animals. In addition, *chaban camps* were a source of disturbance. In every *koshar-stable* there were around 600-900 sheep accompanied by dogs, or roaming group of yaks in highland pastures (Fedosenko, 2000:156).

In countries such as Kyrgyzstan a large number of free-ranging livestock impacted on the population of wild predators by serving as a food base in addition to natural prey species (Vyrypaev, 1979). This resulted in the intensification of conflicts caused by livestock depredation, consequently leading to the retaliatory culling of wild predators.

As the Alai region was fully oriented on animal husbandry the main issue was provision of sufficient fodder for winter. Construction of irrigation channels enabled the expansion of agricultural land under cultivation. The need for additional fodder for livestock resulted in the establishment of new settlements such as the Kabyk, Achyk-Suu and Sary-Mogol villages, where crop cultivation was undertaken to meet the demand of animal husbandry. Where the land was suitable, fodder crops such as barley, alfalfa and sainfoin (*Onobrychis*) were cultivated. But it was not enough and to be able to practice stall-feeding of livestock this had to be supplemented by fodder transported in from other lowland parts of Southern Kyrgyzstan. Nowadays, due to the shortage of hay or to save forage, livestock is grazed around the villages in winter where it attracts wild predators. Moreover, not all pastoralists have properly constructed livestock shelters. Many livestock depredations happened where predators could access the livestock in their corrals.

Following the dissolution of state and collective farms, the number of cattle is still almost at the same level, while the number of sheep and goats has decreased significantly. However, in recent years there is a trend in the growth of livestock numbers. The general decline of livestock positively affected the far distance pastures and there are reports of slow recovery of the population of wild ungulates accordingly. However, there is the widespread issue of poaching.

In the past, the Alai region was a buffering zone during the “Great Game” time between empires. Now this region again has become a part of “Modern Great Game” for markets, development projects and utilizing the natural resources of Central Asia. The Alai Valley is the shortest route to deliver natural transit gas from Turkmenistan to the western territories of China (Fig. 7.3). Moreover, the Government of Kyrgyzstan announced the establishment of the Alai Nature Park, which has been driven by the international nature conservation community.

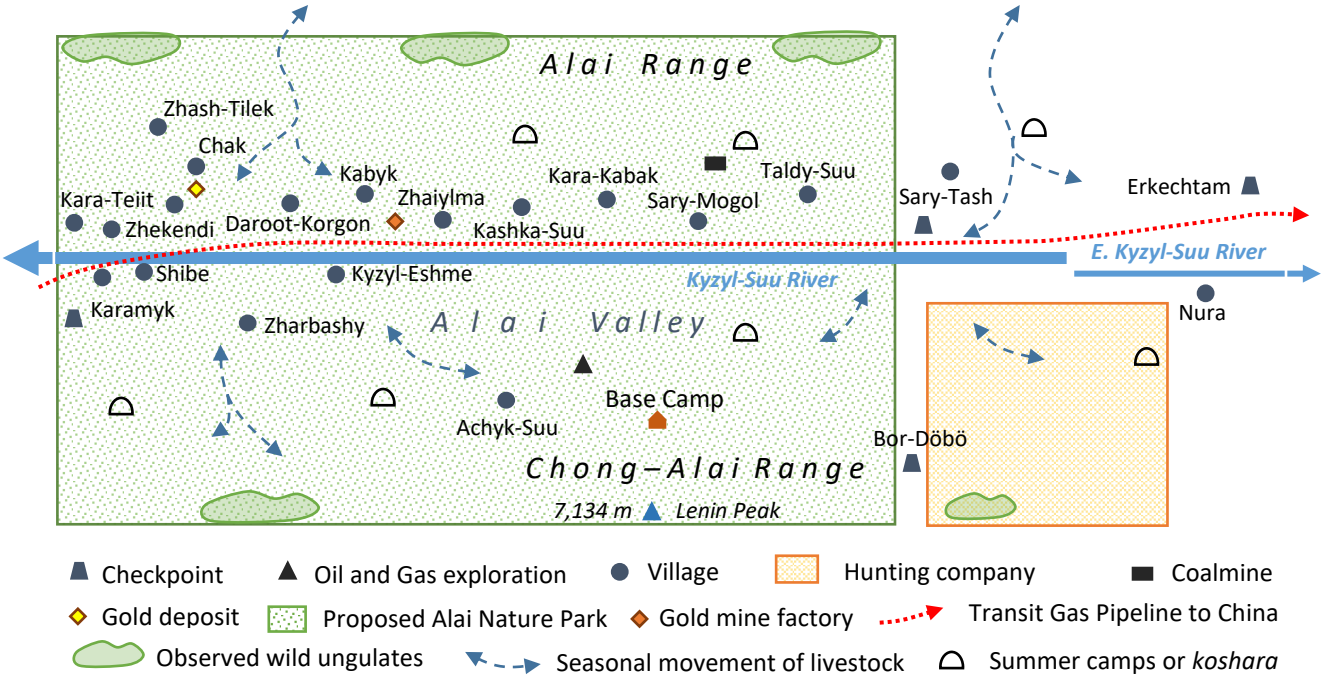

Figure 7.3 Settlement expansion in the Alai Valley by 2020
Source: Own design based on Davletbakov et al. 2016; Izumiyama et al. 2009 and field survey in 2015-2018

After the dissolution of the Soviet Union in 1991 and the privatisation of livestock assets of the country during 1994-1996, the animal husbandry industry became even more important for rural areas by becoming the main income source for local livelihoods. Human-wildlife conflict mitigation measures provide the core focus for sustainable wildlife management. The three main components that shape the human-wildlife interrelation in Kyrgyzstan are the number of protected areas, and the development of pastoralism and the hunting economy.

7.2 Present challenges for wildlife protection

The role of domestic animals is important for the survival of the given the decreasing number of wild prey in Kyrgyzstan (Rukovsky, 1985:333). The wildlife conservation community advocates that the establishment of new protected areas can mitigate the human-wildlife conflict, but the rural population is dependant of pastoralism and the number of livestock requiring pasture is steadily increasing.

Some respondents from the case study area believe that the establishment of the Alai Nature Park could mitigate the 'wolf issue', as in the protected area there is a strict control over the hunting of ibex, which is among the main wild prey of wolves. Most probably pastoralists are not aware that within the territory of the protected area they will be not allowed to hunt wolves. Further, all economic activities including pastoralism will be regulated under the Law "About

Specially Protected Areas of the Kyrgyz Republic". Under this law, pastoralists will negotiate with the State Agency on Environmental Protection and Forestry instead of the Pasture Committee.
Trophy hunting in Kyrgyzstan is widespread and promoted as a sustainable wildlife conservation tool. In some places trophy hunting companies border with the territory of protected areas such as the Naryn State Nature Reserve, Sarychat-Ertash State Nature Reserve, Karakol Nature Park and Khan-Tengiri Nature Park. Pastoralists do not see the benefits from their economic activity. Moreover, hunting concessions compete with them for pastures. There is also considerable opposition to it from civil society. The number of hunters in the country has increased over the past several years. Activists raised the concept of a hunting ban from 2013 and some deputies from the Parliament have introduced this initiative several times since then. However, their attempts have not been successful. In 2017 and in 2019 there was again an initiative to announce a moratorium for hunting of game species however, again, a majority of votes could not be attained in the Kyrgyz Parliament to support this.
Wildlife is a part of state property in Kyrgyzstan and the State Agency on Environmental Protection and Forestry is the authorised governmental body to make decisions on exploitation and implementation of wildlife conservation activities. In this role, the State Agency on Environmental Protection and Forestry is the GEF Operational Focal Point in the country, from which the dominant funding is provided for nature protection. Apart from governmental organisations, there are many local NGOs and international agencies who devote their efforts to conservation of animal species and to make wildlife management as a political aspect of environmental management.

7.2.1 External actors contributing to reconciliation?

During the socialist era the issue of predators was solved and organised differently and linked with the form of animal husbandry. Nowadays the way of tending livestock, the system of grazing management, and the keeping and ownership of livestock in Kyrgyzstan is different from these previous eras. Therefore, to better understand this phenomenon it is necessary to look back into the history of pastoralism in the country. While during the socialist time the loss of a small percentage of state-owned livestock to wild predators had minimal economic hardship for pastoralists, since the privatisation of livestock, the loss of even a few sheep to a small herd owner can represent a significant financial loss. Moreover, nowadays, almost all livestock is under private ownership. Instead of the former 470 collective and state farms, there are now over

400,000 individual agricultural farms (NatStatCom, 2017:23). Accordingly, this has led to an increase in the number of official claims from conflict with wild predators.

In particular, the snow leopard is one of the species that has declined due to habitat loss, trapping, human persecution and reduction in the number of prey species and their distribution throughout Kyrgyzstan and globally (Snow Leopard Working Secretariat, 2013). In addition to this, in Kyrgyzstan, snow leopards were also trapped in high numbers to supply Zoos in other parts of the world. The species was listed in the IUCN Red List as "Endangered" in 1986. It is widely recognised as a global "flagship species" and functions as a symbol of an entire wildlife conservation campaign. It was promoted by conservation community that protecting the snow leopard, its prey species, and its habitat, is critical to protecting broader eco-regions, such as the high-altitude grasslands and wetlands of the Central Asian mountain region.

In October 2013, the Global Snow Leopard Conservation Forum was held in Bishkek. It resulted in the Bishkek Declaration on the Conservation of the Snow Leopard where all twelve "habitat countries" accepted the Global Snow Leopard and Ecosystem Protection Program (GSLEP) with general funding of 190 million USD.

It was declared to:

- "Strengthen capacity for community-based conservation, law enforcement support, and wildlife and ecosystem management, among policy makers, front-line managers and staff, community leaders, and civil society by supporting knowledge exchange and communities of practice and communication and cooperation among stakeholders".
- "Agree to establish a Working Secretariat in Bishkek, Kyrgyz Republic, to facilitate Program development after the Global Snow Leopard Conservation Forum".
- "Request the Global Environment Facility, Global Tiger Initiative, Nature and Biodiversity Conservation Union (NABU), Snow Leopard Conservancy, Snow Leopard Trust, United Nations Development Programme, United States Agency for International Development, World Bank, World Wildlife Fund, and other interested partners to support the Working Secretariat and subsequently the Program Secretariat".
- "Communicate to citizens and particular stakeholders, including local communities, youth, governments, civil society, and the private sector, about the value of Snow Leopards and their ecosystem, and sustain the effort by celebrating October 23 each year as the International Snow Leopard Day with presentation of an annual International Snow Leopard Conservation Award, and 2015 the International Year of the Snow Leopard" (The

Bishkek Declaration on the Conservation of the Snow Leopard, Adopted by the 12 snow leopard range countries in Bishkek, Kyrgyz Republic, October 23, 2013)[121].

Since then, with the financial support received from donor organisations, the Kyrgyz Government has promoted the establishment of new Protected Areas such as the Kan-Achuu (2015), Alatai (2016) and Khan-Tengiri (2016) Nature Parks.

In 2017 the International Union for Conservation of Nature has altered the status of the snow leopard and this has occurred despite much debate by field-conservationists as to the current population size, and with experts believing that many animals are poached and deaths are unreported (Holt et al. 2018:97). It was discussed that the change in status from Endangered (1986) to Vulnerable (2017) could adversely affect conservation programmes, especially in developing countries with limited funds.

Conservation funding favours endangered rather than vulnerable species, so establishing the exact population of snow leopard in each of the habitat countries is crucial for successful conservation efforts. Nevertheless, in 2020, the Critical Ecosystem Partnership Fund (CEPF) in coordination with the WWF launched the grant program for the Mountains of Central Asia Biodiversity Hotspot. This funding is available to countries that have signed the Convention on Biological Diversity, where they become eligible to receive funds from the GEF, and therefore become client members of the World Bank group.

On April 16, 2021, during the plenary meeting of its 75th session, the UN General Assembly unanimously adopted a new resolution A/RES/75/271 initiated by the Kyrgyz Republic entitled "Nature knows no borders: transboundary cooperation – a key factor for biodiversity conservation, restoration and sustainable use". In 2019-2020, all foreign missions of the Kyrgyz Republic carried out a wide international campaign to promote the project, and received support from global environmental organisations, such as the Nature and Biodiversity Conservation Union of Germany (NABU), the UN Convention on Biodiversity, the Convention on Migratory Species, the Ramsar Convention (Ministry of Foreign Affairs of the Kyrgyz Republic, 2021). The adopted Resolution will facilitate the establishment of the Alai Nature Park, which is promoted as the transboundary protected area. However there is little awareness among locals about the future Protected Area and how it will affect pastoralism in the Alai Valley.

[121] See https://globalsnowleopard.org/bishkek-declaration

7.2.2 The future of coexistence: resolving human-wildlife conflict

It is known that the human-wildlife interrelationship is dynamic and research on human-wildlife coexistence has rapidly increased in the last decades. Because of its fundamentally multidimensional characteristics and complexity, this interaction is often framed as human-wildlife conflicts (König et al. 2020). Achieving coexistence in practice is difficult and recognised as a key challenge in wildlife conservation. For the sustainability of conservation initiatives, it is essential to understand the importance of wildlife conservation, and the cooperation of the local population (Ostermann-Miyashita et al. 2021). Therefore wildlife conservationists focus on strategies to reduce conflict, increase human tolerance for problem-causing species and to amplify the benefits that stem from wildlife conservation.

The difficult socioeconomic situation that Kyrgyzstan faced after the dissolution of the Soviet Union had direct impact on the wildlife. The high level of poaching of wild ungulates resulted in a decrease of their population. The decrease of the wild prey species population is considered as one of the key issues for predator conservation. It is believed that ensuring a sufficient natural food base would minimise the depredation on livestock. Therefore many efforts aimed at increasing the population of prey species especially the wild ungulates such as ibex and argali. For instance, the Snow Leopard Foundation of Kyrgyzstan and the NABU branch in Bishkek are working on the combat of poaching. While other NGOs, such as Panthera and the Ilbirs Foundation, are facilitated and organised community-based conservancies in the Alai Valley, with the perspective to host trophy hunters in the future.

Livestock depredation by wild predators is a crucial issue and its mitigation measures are reported worldwide. In many developed countries there are specially designed compensation schemes for wildlife damage. This way of creating tolerance and as a conflict mitigation tool is dominantly in use in regard to large animals. A majority of species covered by such programs includes the order carnivora and the most common reason for compensation is represented by livestock losses (Ravenelle and Nyhus, 2017:1250). Compensation programs have also been introduced in some developing countries and mainly financed by international NGOs. This means it is mostly dependant on external funds and usually ends when the funding ceases. Accordingly, in terms of sustainability, the effectiveness of the compensation scheme is widely debated. In Kyrgyzstan for today there is no such compensation program, but wildlife conservation projects promote other non-lethal measures. It includes proper construction such as roofing of corrals, use of guard dogs, stall-feeding and keeping in winter. This, in turn, amounts to additional expenses for the pastoralists.

8 Conclusions

The Political Ecology of wildlife management and pastoralism today is its embodiment that the pastoralists represent the face of contemporary Kyrgyzstan. The institutional setup of today is a reflection and result of earlier forms of social organisations and economic priorities. The management of communal resources is organised through either consensus, state directives or decentralised bodies. Each period had its own form of organisation, but in the present time we find some long-lasting arrangements of consensus seeking. The dissolution of collective and state farms was a turning point in further development of the pastoralism of nowadays. The privatisation programme in agriculture created challenges and opportunities in rural post-socialist Kyrgyzstan. The transition into the market economy, the privatisation of agricultural assets, and the distribution of livestock to the rural population, increased the importance of pastoralism for rural livelihood strategies.

In the territories of the former collective and state farms there were established local municipalities. They were responsible for socio-economic issues on a local level, which were previously centrally managed. Radical changes took place in the use of natural resources such as pastures and wildlife as well as priorities for animal husbandry, and the agenda for nature conservation in the form of Protected Areas establishment, were changed over time in post-socialist Kyrgyzstan. For instance, the use of pastures, once fully decentralised, went under the administration of Pasture Committees. While the overall area of Protected Areas is increasing and the wildlife conservation agenda has become a priority, the human-wildlife conflict is a central issue in the human-wildlife interrelationship of contemporary Kyrgyzstan. Protected Areas are recognised as crucial to the success of large predator conservation. In recent years the Kyrgyz Government has established three new Nature Parks, all of them are in sparsely populated areas. However the future plans about establishment of new Protected Areas in the pastoral territory such Alai Valley raises mixed expectations among pastoralists.

The Political Ecology of wildlife management today is a set of influential actors with their interests on how wildlife should be managed in contemporary Kyrgyzstan. In comparison to the Soviet times, the use of wildlife resources involves many interested parties, and the sphere of the human-wildlife interrelationship is shaped by many factors. Spatial utilisation strategies have been changing in accordance with the shift of environmental policy which is significantly shaped by external actors. The global environmental agenda facilitated by many powerful and leading actors has had significant influence. Becoming a Party to several global environmental conventions has increased the realisation of many projects funded by external donor

organisations, and the implementation of their obligations for wildlife conservation, together, have substantially raised the profile of wildlife management in Kyrgyzstan at the international level. However, in many cases the voice or points of view of pastoralists who live in close contact with the wildlife, or share the same landscapes, are often overlooked. Therefore, to better understand the human-wildlife interrelationship it is necessary to look at the concerns and challenges of the pastoralists as well.

The pastures in Kyrgyzstan represent the dominant portion of agricultural land remaining in state ownership, and it involves many users. Hunting companies are interested and compete with pastoralists for this valuable resource and space. The Pasture Committees result from the decentralisation of pasture management. The members of the Pasture Committee are elected at the general meeting of the Pasture User's Association for three years. According to the Kyrgyz Pasture Law, they implement an overall strategy for the rational use of pasture resources. However, in practice, the Pasture Committee is often involved in many issues related to pastoralism such as veterinarian services or predator control activities. Despite this, pastoralists generally expect the Pasture Committee to be more active and influential in representing and protecting the interests of the pastoralists.

Roadmap to coexistence

The vast range required by large predators means that they and humans must co-exist to prevent conflict between pastoralism and wildlife management and the depredation of livestock by wild predators. Because wild predators threaten the livelihood of pastoralists, and the spread of zoonic diseases to livestock, and human safety, the coexistence in the agricultural landscape is a challenging issue.

The following findings and outcomes can be derived from the field surveys. Livestock depredation by wolves has increased due to several reasons such as use of livestock shelters that are not properly protected from wild predators, the lack of tending during grazing, the high level of poaching of predators' natural prey species, especially wild ungulates, and the changes in livestock production systems and ownership. The most common livestock protection measures include the use of guard dogs and predator population control.

Livestock depredation by wolves has a seasonal character and intensifies in winter. Accordingly, more attention is required for livestock protection activity during wintertime. Protective measures are effective ways of reducing livestock depredation by wild predators and achieving coexistence. The use of modern techniques such electric fences would minimise the loss of livestock, however for the pastoralists in Kyrgyzstan this would require a large amount of money.

Institutional and legislative arrangements regulating the wildlife management are slowly improving. The adopted laws “About Preservation of the Environment” and “About Hunting and Hunting Economy” facilitate the engagement of the local communities in conservation activities, especially in relation to poaching of wild ungulates.

Open questions for future research

The human-wildlife conflicts between pastoralists and predators have undoubtedly increased in recent years and have attracted public attention and are now the subject of intense coverage by the local media in Kyrgyzstan. The livestock population is growing steadily and conflicts over the use of pastures is increasing. Thus, the potential for conflict between major sectors of the economy of Kyrgyzstan such pastoralism and protected area management is likely to increase in the future. Therefore, the biological aspects of human-wildlife interaction, as well as in relation to climate change deserves scientific attention. Nowadays the development of telemetry research methods and camera traps are practiced worldwide. The use of GPS satellite collars to track the tagged wild animals and provide detailed and accurate data on their movement, habitat selection and home range size, is critical. The data collected from tracking increases the possibilities to identify and introduce adaptive measures for conflict mitigation and to increase the overall effectiveness of wildlife management.

The human-wildlife interrelationship is dynamic and complex, where political agenda is a fundamental aspect. The new Constitution of Kyrgyzstan that passed by referendum on 11 April 2021, reintroduced a strong presidential power that is significant for wildlife management. Soon after the promulgation of the Law About Constitution of the Kyrgyz Republic on 5 May 2021, the President started to reorganise the structure of the Government including the reorganisation of the administrative functions of state bodies which are responsible for natural resources such as forestry and protected areas.

Literature

Abazov R (2004) Historical dictionary of Kyrgyzstan. Asian/Oceanian Historical Dictionaries, No. 49. The Scarecrow Press, Lanham, Maryland and Oxford

Abdrakhmanov J (1991) 1916. Dnevniki. Pisma k Stalinu (1916. Diaries. Letters to Stalin). Izdatelstvo Kyrgyzstan, Frunze

Abdurashitov A (2015) Rynochnaya transformatsiya agrarnoi ekonomiki Kyrgyzskoi Respubliki (Market Transformation of the Agrarian Economy of the Kyrgyz Republic). Kyrgyz-Slavic University, Izdatelstvo KRSU, Bishkek

Acharya KP, Paudel PK, Neupane PR, Köhl M (2016) Human-Wildlife Conflicts in Nepal: Patterns of Human Fatalities and Injuries Caused by Large Mammals. PLoS ONE 11(9): e0161717

Adams W (2004) Against Extinction: The Story of Conservation (1st ed.). Routledge, London

Afanasev V (2006) Taina zolotoi reki (The secret of golden river). http://www.e-reading.club/book.php?book= 1033914 accessed on 30.03.2016

Aizin BM, Vorobyov GG, Vyrypaev VA, Markov PA, Toktosunov AT et al. (1985) Mlekopitaiuschie (Mammals). In: Mamytov AM, Zamoshnikov VD, Vorobyov GG, Pasechnik ST (eds) Krasnaya Kniga Kirgizskoi SSR. Redkie i nakhodyaschiesya pod ugrozoi ischeznoveniya vidy zhyvotnykh i rasteniy (Red Book of Kyrgyz SSR. Rare and endangered species of animals and plants). Gosudarstvennyi komitet Kirgizskoi SSR po lesnomu khosyaistvu (State Committee on Forestry of Kyrgyz SSR), Goskomizdat, Frunze

Akaev A (2000) The transition economy through the eyes of a physicist (mathematical model of the transition economy). Bishkek

Ale SB, Mishra C (2018) The snow leopard's questionable comeback. Science, Volume 359, Issue 6380

Anarbaev M (2018) Soil Legislation and Policy in the Kyrgyz Republic on the Development of the Law “On Soil Fertility Protection of Agricultural Lands”. In: Ginzky H, Dooley E, Heuser I, Kasimbazi E, Markus T, Qin T (eds) International Yearbook of Soil Law and Policy 2017. International Yearbook of Soil Law and Policy. Springer, Cham

Anarbaev M, Kyrbashev J, Davletbakov A, Izumiyama S (2019) Distribution and Conservation Status of Tien-Shan Brown Bear in the Kyrgyz Republic. International Bear News. Summer 2019, Volume 28. No. 2. pp 15–17

Andelt WF (1995) Livestock Guarding Dogs, Lamas and Donkeys for Reducing Livestock Losses to Predators. Fort Collins, CO: Colorado State University

Anderson J (1999) Kyrgyzstan: Central Asia's island of democracy? Harwood Academic Publishers, Amsterdam

Andreev G (2005) Alpinisty Severnoi stolitsy (Mountaineers of the Northern Capital). Askort-Reprint, Saint Petersburg. http://www.alpklubspb.ru/ass/a388.htm

Arase T, Liu J, Watanabe T (2013) Degeneration of Alpine Steppe Vegetation around Sary-Tash Village, Kyrgyz Republic. Geographical Studies, Volume 88, No. 2

Attokurov S (1982) Sotsialisticheskaya industrializatsiya (Socialist industralisation). In: Oruzbaeva BO (ed) Kirgizskaya Sovetskaya Sotsialisticheskaya Respublika. Entsiklopediya. Akademiya Nauk Kirgizskoi SSR, Gosudarstvennyi Komitet Kirgizskoi SSR po delam izdatelstv, poligrafii i knizhnoi torgovli. (Kyrgyz Soviet Socialist Republic. Encyclopaedia. Academy of Sciences of the Kyrgyz SSR, State Committee of the Kyrgyz SSR for Publishing, Printing and Book Trade). Glavnaya Redaktsiya Kirgizskoi Sovetskoi Entsiklopedii, Frunze, pp 143–144

Badenkov YP (1990) Sustainable Development of the Mountain Regions of the USSR. The Realities, the Role of Science, and Research Orientations. Mountain Research and Development, Volume 10, No. 2, Transformation of Mountain Environments (TOME). Part One, pp 129–139

Badenkov YP (2017) Zhizn v gorakh. Prirodnoe i kulturnoe raznoobrazie – raznoobrazie modelei razvitiya (Life in the mountains. Natural and cultural diversity – variety of development models). GEOS, Moscow

Bagchi S, Mishra C, Bhatnagar YV (2004) Conflicts between traditional pastoralism and conservation of Himalayan ibex (Capra sibirica) in the Trans-Himalayan mountains. Animal Conservation 7, pp 121–128

Baktygulov DC, Mombekova ZK (2001) Istoriya kyrgyzov i Kyrgyzstana s drevneishikh vremen do nashykh dnei (History of the Kyrgyz and Kyrgyzstan from ancient times to the present day). Kyrgyzstan-Mektep, Bishkek

Baktygulov DS (1986) Istoriografiya sovetskogo Kyrgyzstana 1918-1940 gg. (Historiography of history of the Soviet Kyrgyzstan in 1918-1940). Uchebnoe posobie, Frunze

Barmintsev YN (1972) Konnozavodstvo i konnyi sport (Horse breeding and equestrian sport), Kolos, Moscow

Baskin LM (2009) Status of regional moose populations in European and Asiatic Russia. Alces. Volume 45:1-4

Bazhanova LV (2009) Pilotnyi uchastok Chong-Alaiskogo rayona Oshskoi oblasti (Pilot site of Chong-Alai rayon Osh oblast). Report for the GEF/UNEP/UNU Project "Sustainable Land

Management in the High Pamir and Pamir-Alai Mountains – Integrated and Transboundary Initiative in Central Asia, Bishkek

Beishebaev KK, Vorobyov GG, Kydyraliev AK, Umrikhina GS, et al. (1985) Ptitsy (Birds). In: Mamytov AM, Zamoshnikov VD, Vorobyov GG, Pasechnik ST (eds) Krasnaya Kniga Kirgizskoi SSR. Redkie i nakhodyaschiesya pod ugrozoi ischeznoveniya vidy zhyvotnykh i rasteniy (Red Book of Kyrgyz SSR. Rare and endangered species of animals and plants). Gosudarstvennyi komitet Kirgizskoi SSR po lesnomu khosyaistvu (State Committee on Forestry of Kyrgyz SSR), Goskomizdat, Frunze

Beletsky EA (2013) Pik Lenina (Lenin Peak). The first edition published in 1958. Izdatelstvo Igorya Balobanova, Moscow

Beschta RL, Ripple WJ (2009) Large predators and trophic cascades in terrestrial ecosystems of the western United States. Biological Conservation, Volume 142, Issue 11, pp 2401–2414

Bibikov DI (ed) (1985) Volk. Proiskhozhdenie, sistematika, morfologiya, ekologiya (The Wolf. History, Systematics, Morphology, Ecology). Izdatelsvto Nauka, Moscow

Bibikov DI, Priklonsky SG, Filimonov AN (1985) SSSR (USSR). In: Bibikov DI (ed) Volk. Proiskhozhdenie, sistematika, morfologiya, ekologiya (The Wolf. History, Systematics, Morphology, Ecology). Izdatelsvto Nauka, Moscow

Blaikie P (1985) The political economy of soil erosion in developing countries. Longman: London and New York

Blaikie P (1995) Changing Environments or Changing Views? A Political Ecology for Developing Countries. Geography, Volume 80, No. 3, pp 203–214

Blaikie P, Brookfield H (1987) Land Degradation and Society (1st ed.). Routledge

Blomqvist L (1980) Distribution and status of the snow leopard (Panthera uncia). Tiger Paper, VII (4):15–20

Blomqvist L (1995) Three decades of Snow leopards (Panthera uncia) in captivity. International Zoo Yearbook, 34:178–185

Bogdetsky V, Ibraev K, Abdyrakhmanova Z (2005) Gornodobyvaiushchaya promyshlennost kak istochnik rosta ekonomiki Kyrgyzstana (Mining industry as a source of economic growth in Kyrgyzstan). World Bank, Bishkek

Boitani L (1995) Ecological and cultural diversities in the evolution of wolf-human relationships. In: Carbyn LN, Fritts SH, Seip DR (eds) Ecology and Conservation of Wolves in a Changing World. Edmonton, Alberta: Canadian Circumpolar Institute, Volume 35, pp 3–12

Boitani L, Phillips M, Jhala Y (2018) Canis lupus (errata version published in 2020). The IUCN Red List of Threatened Species 2018: e.T3746A163508960

Borchers P (1931) Berge und Gletscher im Pamir. Verlag von Strecker und Schröder in Stuttgart

Boreiko VE (2011) V zaschitu volkov (In defence of the wolves). Okhrana dikoi prirody, Issue 68. Izdatelstvo Lotos. Kiev

Borneman BA (1935) Severnyi sklon Zaalaiskogo khrebta (The northern slope of the Zaalaisky Range). In: Fersman AE, Gorbunov NP, Scherbakov DI, Nalivkin DV et al. (eds) Tadzhiksko-Pamirskaya ekspeditsiya 1934 (Tajik-Pamirian Expedition in 1934). Academy of Science of the USSR, Moscow-Leningrad

Botbaev IM (1983) Vyvedenie i sovershenstvovanie alaiskoi porody ovets (Breeding and Improvement of Alai Breeds of Sheep). Ministerstvo selskogo khozyaistva Kirgizskoi SSR, Frunze

Bötönöev Zh (2015) Bai-manaptar kantip kulakka tartylgan? (How bai-manaps were dekulakised?). http://erkintoo.kg accessed on 23.12.15

Brechin SR, Fortwangler CL, Wilshusen PR, West PC (2003) Contested Nature: Promoting International Biodiversity with Social Justice in the Twenty-First Century. State University of New York Press

Breitenmoser U, Angst C, Jean-Marc L, Breitenmoser-Würsten C, Linnell J, Weber JM (2005) Non-lethal techniques for reducing depredation. In: Woodroffe R, Thirgood S, Rabinowitz A (eds) People and wildlife: conflict or coexistence? Cambridge University Press, Cambridge, pp 13–26

Breitenmoser U, Breitenmoser-Würsten C, Lanz T, von Arx M, Antonevich A, Bao W, Avgan B (2015) Lynx lynx. The IUCN Red List of Threatened Species

Bridge G, McCarthy J, Perreault T (2015) Editor's introduction. In: Perreault T, Bridge G, McCarthy J (eds) The Routledge Handbook of Political Ecology. Routledge

Broido GI (1925) Vosstanie Kirgiz v 1916 g. (Riot of Kyrgyz in 1916), Nauchnaya Assotsiatsiya Vostokovedeniya pri TsIK SSSR, Moscow

Brooks P (2014) Speaking for nature: the literary naturalists, from transcendentalism to the birth of the American environmental movement, Dover Publications, Mineola, New York

Browman DL (1983) Andean Arid Land Pastoralism and Development. Mountain Research and Development, Volume 3, No. 3, pp 241–252

Bryant RL (2015) (ed) The International Handbook on Political Ecology. Cheltenham, Edward Elgar

Bryant RL, Bailey S (1997) Third World Political Ecology. New York. Routledge

Budyansky DM (2007) Istoriya bezhentsev-kyrgyzov (1916-1927 gody) (History of Kyrgyz-refugees in 1916-1927). Bishkek

Butt B, Turner MD (2012) Clarifying competition: the case of wildlife and pastoral livestock in East Africa. Pastoralism: Research, Policy and Practice, 2:9

Callahan T (2012) Pastoral Production Strategies and Market Orientation of the Afghan Kirghiz. In: Kreutzmann H (ed) Pastoral practices in High Asia. Advances in Asian Human-Environmental Research. Springer Science+Business Media B.V.

Central Department for Statistics Kyrgyz SSR (1981) Narodnoe khozyaistvo Kirgizskoi SSR v 1980 godu (National economy of Kirgiz SSR in 1980). Kyrgyzstan, Funze

Cherp A (2001) Environmental assessment in countries in transition: Evolution in a changing context. Journal of Environmental Management, 62(4):357–374

Cherp O, Lee N (1997) Evolution of ser and ovos in the Soviet Union and Russia (1985-1996). Environ Impact Assess Rev 17(3):177–204

Chertkov VA, Zhabuev BA, Vassova VY, (1999) Sostoyanie yakovodstva v Kyrgyzskoi Respublike i puti ego uluchshenia (The state of yak breeding in the Kyrgyz Republic and ways to improve it). In: Akimaliev JA (ed) Selskoe khozayaistvo Kyrgyzstana: problemy i dostizheniya v obrazovanii i nauchno-issledovatelskoi rabote (Agriculture: problems and achievements in education and research). Sbornik nauchnykh trudov Kyrgyzskogo Agrarnogo Universiteta, Vypusk 2, Bishkek

Chichikin YN, Vorobyov GG (1967) Dikiy kaban yuga Kirgizii (Wild boar of southern Kyrgyzstan). Izdatelstvo Kyrgyzstan, Frunze

Chotonov UC, Abdrakhmanov DA (2009) Istoriya Kyrgyzstana (History of Kyrgyzstan). Bishkek

Chotonov UC, Nur uulu D (2009) Istoriya Otechestva. Uchebnik dlya vuzov (The history of homeland. Textbook for universities). Uchkun, Bishkek

CMS Convention on the Conservation of Migratory Species of Wild Animals (2014) Programme of Work for the Central Asian Mammals Initiative (2014-2020). CMS-UNEP

Coltman DW, O'Donoghue P, Jorgenson JT, Hogg JT, Strobeck C, Festa-Bianche M (2003) Undesirable evolutionary consequences of trophy hunting. Nature, Volume 426, pp 655–658

Conover MR (2002) Resolving Human-Wildlife Conflicts: The Science of Wildlife Damage Management. CRC Press, Boca Raton

Conservation International (2005) Biodiversity Hotspots. https://www.conservation.org/priorities/biodiversity-hotspots. Accessed on 10.02.2015

Convention on Biological Diversity (2011) The Aichi Biodiversity Targets. http://www.cbd.int/doc/strategic-plan/2011-2020/Aichi-Targets-EN.pdf accessed on 10.07.2015

Cooley A (2012) Great Games, Local Rules: The New Great Power Contest in Central Asia. Oxford University Press, Oxford

Cowan PJ (2007) Geographic usage of the terms Middle Asia and Central Asia. Journal of Arid Environments 69, pp 359–363

Cronon W (1995) The Trouble with Wilderness; or, Getting Back to the Wrong Nature. In: Cronon W (ed) Uncommon Ground: Rethinking the Human Place in Nature, New York: W. W. Norton & Co., pp 69-90

Dadabaev T (2016) Evaluations of perestroika in post-Soviet Central Asia: Public views in contemporary Uzbekistan, Kazakhstan and Kyrgyzstan. Communist and Post-Communist Studies 49(2):179–192

Danilkin AA (2005) Mlekopitaiushchie Rossii i sopredelnykh regionov (Mammals of Russia and adjacent regions). KMK, Moskva

Davis DK (2015) Historical Approaches to Political Ecology. In: Perreault T, Bridge G, McCarthy J (eds) The Routledge Handbook of Political Ecology. Routledge

Davletbakov A, Rosen T, Anarbaev M, Kubanychbekov Z, Jumabai uulu K, Samanchina J, Sharma K (2016) Central Asia: Kyrgyzstan. In: McCarthy T, Mallon D (eds) Snow Leopards. Biodiversity of the world: Conservation from genes to landscapes. Elsevier, pp 419–425

Davletbakov AT (2012) Survey of argali and ibex as well as other mammal species in the territory of Kyrgyzstan. Report of the Project Sustainable Management of Mountain Ungulates in Kyrgyz Republic, Bishkek

Denisov VF (1958) Razvedenie yakov (Yak breeding). Voroshilovskaya tipografiya Frunzenskogo oblpoligrafizdata, Frunze

Dickman AJ (2010) Complexities of conflict: the importance of considering social factors for effectively resolving human–wildlife conflict. Animal Conservation, 13: 458–466

Djancharov D (2010) Animal husbandry in the Pilot Sites. Prepared for the GEF/UNEP/UNU Project on “Sustainable Land Management in the Highlands of Pamir and Pamir-Alai Mountains”, Bishkek

Doolot A, Heathershaw J (2015) State as resource, mediator and performer: understanding the local and global politics of gold mining in Kyrgyzstan. Central Asian Survey, 34(1), 93–109.

Dörre A (2012) Legal Arrangements and Pasture-Related Socio-ecological Challenges in Kyrgyzstan. In: Kreutzmann H (ed) Pastoral practices in High Asia. Agency of 'development' effected by modernisation, resettlement and transformation (Advances in Asian Human-Environmental Research). Springer, pp 127–144

Dörre A (2014) Naturressourcennutzung im Kontext struktureller Unsicherheiten. Eine Politische Ökologie der Weideländer Kirgisistans in Zeiten gesellschaftlicher. Stuttgart. Franz Steiner Verlag

Dörre A (2015) Promises and realities of community-based pasture management approaches: Observations from Kyrgyzstan. Pastoralism: Research, Policy and Practice 5:15

Dörre A (2016) Changes in the Relationship Between Borders and Pastoral Mobility in Mountain Regions of Central Asia. In: Kreutzmann H, Watanabe T (eds) Mapping Transition in the Pamirs. Advances in Asian Human- Environmental Research. Springer, Cham

Drancourt M (2013) Plague. In: Magill AJ, Hill DR, Solomon T, Ryan ET (eds) Hunter's Tropical Medicine and Emerging Infectious Disease (Ninth Edition), W.B. Saunders, pp 584–590

Ducarme F, Luque GM, Courchamp F (2013) What are "charismatic species" for conservation biologists? Ecole Normale Superieure de Lyon. BioSciences Master Reviews

Dudley N (2008) (ed) Guidelines for Applying Protected Area Management Categories. Best Practice Protected Area Guidelines Series No. 21. IUCN, Gland, Switzerland

Dzhunushaliev D (2003) Vremya sozidaniya i tragediy 20-30e gody XX veka (Time of creation and tragedy during 20-30s of twentieth century). Ilim, Bishkek

Dzhunushev A (1966) Iz istorii obrazovaniya Kirgizskoi Avtonomnoi Respubliki (From the history of the formation of the Kyrgyz Autonomous Republic). Izdatelstvo Kyrgyzstan. Frunze

Elchaninova OY (2012) Pravovoe regulirovanie kolkhoznykh pravootnosheniy: analiz sovetskogo zakonodatelstva 1950-1970 godov (Legal regulation of kolkhoz's legal relationship: analysis of Soviet legislation of the 1950-1970s). Gramota, No. 7 (21):3, Tambov

Eliseev A (2015) Kak Khrushchev Kitai poteryal. Iz istorii sovetsko-kitaiskikh otnosheni (How Khrushchev lost China. From the history of Soviet-Chinese relations). Retrieved at www.stoletie.ru on 15.10.2015

Errington PL (1945) The Wolves of North America by Stanley P. Young and Edward A. Goldman. Ecology, Volume 26, No. 1, p. 108

Eschment B, Grotz F (2001) Kyrgyzstan. In: Nohlen D, Grotz F, Hartmann C (eds) Elections in Asia and the Pacific: A Data Handbook: Volume I: Middle East, Central Asia, and South Asia, Oxford University Press

Escobar A (1998) Whose Knowledge, Whose nature? Biodiversity, Conservation, and the Political Ecology of Social Movements. Journal of Political Ecology, Volume 5, pp 55–82

Fairhead J, Leach M, Scoones I (2012) Green Grabbing: a new appropriation of nature?, The Journal of Peasant Studies, 39(2):237–261

FAO The Food and Agriculture Organisation of the United Nations (2015) Mountains: Key Messages. http://www.fao.org/forestry/communication-toolkit/82919/en/ accessed on 14.10.2015

FAO The Food and Agriculture Organisation of the United Nations (2009) Human-wildlife conflict in Africa. Causes, consequences and management strategies. Forestry Paper 157, Rome

FAO The Food and Agriculture Organisation of the United Nations (2019) FAOSTAT Land Use Module. http://www.fao.org/faostat/en/#data/RL/visualize. Retrieved on 10.07.2019

Farrington JD (2005) A Report on Protected Areas, Biodiversity, and Conservation in the Kyrgyzstan Tian Shan with Brief Notes on the Kyrgyzstan Pamir-Alai and the Tian Shan Mountains of Kazakhstan, Uzbekistan, and China. Bishkek: U.S. Fulbright Program, Environmental Studies Section

Farrington JD, Tsering D (2020) Snow leopard distribution in the Chang Tang region of Tibet, China, Global Ecology and Conservation, Volume 23

FCI Fédération Cynologique Internationale (2011) Sredneasiatskaya ovtcharka (Central Asia Shepherd Dog). FCI-Standart No.335, Secretariat General, Thuin

Fédération Cynologique Internationale (2011) Central Asia Shepher Dog (Sredneasiatskaya Ovtcharka). FCI-Standard No. 335. Thuin, Belgium

Fedosenko AK (2000) Arkhar v Rossii i sopredelnykh stranakh (Argali in Russia and neighbouring countries). Izdatelstvo GU Tsentrokhotkontrol, Moscow

Fedosenko AK, Blank DA (2001) Capra sibirica. Mammalian Species, No.675, American Society of Mammologists, pp 1–13

Fitzherbert A (2000) Country pasture forage resource profile: Kyrgyzstan. FAO, Rome

Förster H, Pachova NI, Renaud FG (2011) Energy and Land Use in the Pamir-Alai Mountains. Mountain Research and Development, 31(4):305-314

Fox JL (1987) Snow Leopard Symposium. Mountain Research and Development, Volume 7, No. 1, p 88

Fox JL, Nurbu C, Bhatt S, Chandola A (1994) Wildlife Conservation and Land-Use Changes in the Transhimalayan Region of Ladakh, India. Mountain Research and Development, Volume 14, No. 1, pp 39–60

Fritts SH, Stephenson RO, Hayes RD, Boitani L (2003) Wolves and Humans. In: Mech LD, Boitani L (eds) Wolves: Behavior, Ecology, and Conservation. Chicago and London: University of Chicago Press

Geist H (2005) The causes and progression of desertification. Abingdon Oxon, UK: Ashgate Publishing

Geist V (2007) When do wolves become dangerous to humans? The University of Calgary, Canada

Gentle P, Thwaites R (2016) Transhumant Pastoralism in the Context of Socioeconomic and Climate Change in the Mountains of Nepal. Mountain Research and Development, Volume 36, No. 2, pp 173–182

Grabherr G (2000) Biodiversity of mountain forests. In: Price MF, Butt N (eds) Forests in sustainable mountain development: A state of knowledge report for 2000. IUFRO research series 5. Oxon, New York, pp 85–90

Grabherr G, Messerli B (2011) An Overview of the World's Mountain Environments. In: Austrian MAB Committee (eds) Biosphere Reserves in the Mountains of the World

Grachev YA, Fedosenko AK (1975) Contemporary Distribution and Numbers of Snow Leopards in Kazakhstan. pp 122–123 retrieved at https://snowleopardnetwork.org

Graham NA, Pueppke SG, Uderbayev T (2017) The Current Status and Future of Central Asia's Fish and Fisheries: Confronting a Wicked Problem. Water, 9(9):701

Green JS, Woodruff RA (1996) Livestock Guarding Dogs. Protecting Sheep from Predators. United State Department of Agriculture. Agriculture Information Bulletin Number 588

Groombridge B, Jerkins MD (2002) World Atlas of Biodiversity. Prepared by the UNEP World Conservation Monitoring Centre. University of California Press. Berkeley, USA

Gumilev LN (2003) Drevnie Tyurki. Istoria obrazovania i rastsveta Velikogo tyurkskogo kaganata (Ancient Turks. The history of the formation and prosperity of the Great Turkic Kaganate). Kristall

Hanlon CA, Niezgoda M, Rupprecht CE (2007) Rabies in Terrestrial Animals. In: Jackson AC, Wunner WH (eds) Rabies (Second Edition), Academic Press

Hannam I (2018) Governance of Pastoral Lands. In: Ginzky H, Dooley E, Heuser I, Kasimbazi E, Markus T, Qin T (eds) International Yearbook of Soil Law and Policy 2017. International Yearbook of Soil Law and Policy. Springer, Cham

Hanson T, Brooks TM, Da Fonseca GAB, Hoffmann M et al. (2009) Warfare in Biodiversity Hotspots. Conservation Biology, 23: 578–587

Harris JD, Brown PL (2009) (eds) Wildlife: Destruction, Conservation and Biodiversity. Nova Science Publishers, New York

Harris RB, Reading R (2008) Ovis ammon. The IUCN Red List of Threatened Species 2008 e.T15733A5074694

Hart S (ed) (2008) Shared resources: Issues of Governance. IUCN Environmental Policy and Law Paper. No. 072. Gland, Switzerland

Haswell PM (2019) Behind enemy lines: investigating suppression and coexistence between sympatric carnivores in Plitvice Lakes, Croatia. PhD Thesis. Ronin Institute. Prifysgol Bangor University

Hatley T, Thompson M (1985) Rare Animals, Poor People, and Big Agencies: A Perspective on Biological Conservation and Rural Development in the Himalaya. Mountain Research and Development, Volume 5, No. 4, pp 365–377

Haugen A (2003) The Establishment of National Republics in Soviet Central Asia. Palgrave Macmillan, New York

Hepburn C, Helm D (2012) The economic analysis of biodiversity: an assessment. Oxford Review of Economic Policy, Volume 28, No. 1, 2012, pp 1–21

Heptner VG, Naumov NP, Yurgenson PB, Sludsky AA, Chirkova AF, Bannikov AG (1967) In: Heptner VG and Naumov NP (eds) Mlekopitayuschie Sovetskogo Soiuza. Morskie korovy i khischnye (Mammals of Soviet Union. Sea cows and carnivora). Volume II, Part I. Vysshaya shkola, Moskva, 1004 p.

Heptner VG, Sludsky AA (1972) (eds) Mlekopitayuschie Sovetskogo Soiuza. Khischnye: gieny i koshki (Mammals of Soviet Union. Carnivora: hyenas and cats). Volume II, Part II. Vysshaya shkola, Moskva, 552 p

Hernandez-Blanco J, Poyarkov AD, Krutova VI (2005) Organizatsiya semeinoi gruppy volkov (Canis lupus lupus) v Voronezhskom biosfernom zapovednike (Wolf (Canis lupus lupus) pack organisation at the Voronezh Biosphere Reserve). Zoologichesky Zhurnal. Volume 84(1), pp 80–93

Hill CM (2015) Perspectives of “Conflict” at the Wildlife-Agriculture Boundary: 10 Years On, Human Dimensions of Wildlife, 20:4, pp 296-301

Holt CD, Nevin OT, Smith D, Convery I (2018) Environmental niche overlap between snow leopard and four prey species in Kazakhstan. Ecological Informatics, Volume 48, pp 97–103

Hopkirk P (2006) The Great Game: On Secret Service in High Asia. John Murray Publishers

Hu RW (2005) China's Central Asia Policy: Making Sense of Shanghai Cooperation Organisation. In: Rumer BZ (ed) Central Asia at the End of the Transition. Routledge

Huddleston B, Ataman E, de Salvo P, Zanetti M et al. (2003) Towards a GIS-based analysis of mountain environments and populations. Environment and Natural Resources Working Paper No. 10, FAO, Rome

Hurni H, Messerli B (1981) Mountain Research for Conservation and Development in Simen, Ethiopia. Mountain Research and Development, Vol. 1, No. 1, pp 49–54

Hussain S (2003) The status of the snow leopard in Pakistan and its conflict with local farmers. FFI, Oryx, 37(1):26–33

Inskip C, Zimmermann A (2009) Human-felid conflict: a review of patterns and priorities worldwide, Oryx, 43(1):18–34

International Fund for Animal Welfare (2016) Killing for trophies: an analysis of global trophy hunting trade. IFAW

IUCN International Union for Conservation of Nature (2012) IUCN SSC guiding principles on trophy hunting as a tool for creating conservation incentives. Version 1.0, Gland

Ivanova T (2007) O porode Sredneaziatskaya ovcharka: posle poseschenіya chempionata Evropy 2005 goda (About Central Asian Ovtcharka: after visiting European Championship in 2005) at www.irkcao.narod.ru

Ives C, Barker EE (2000) Romanticism and the School of Nature. Nineteenth-Century Drawing and Paintings from the Karen B. Cohen Collection. The Metropolitan Museum of Art. Yale University Press. New York

Izumiyama S, Anarbaev M, Watanabe T (2009) Inhabitation of lager mammals in the Alai Valley of the Kyrgyz Republic. Special issue: Pamir, Geographical Studies, No. 84, Japan

Jackson AC (2014) Rabies. In: Tselis AC, Booss J (eds) Handbook of Clinicl Neurology, Volume 123 (3rd series), Elsevier

Jackson P, Nowell K (2011) Panthera tigris ssp. virgata. The IUCN Red List of Threatened Species 2011: e.T41505A10480967

Jackson R, Wangchuk R (2001) Linking Snow Leopard Conservation and People-Wildlife Conflict Resolution: Grassroots Measures to Protect the Endangered Snow Leopard from Herder Retribution. Endangered Species UPDATE, Volume 18, No. 4

Jackson RM, Ahlborn GG, Gurung M, Ale S (1996) Reducing livestock depredation losses in the Nepalese Himalaya. In: Proceedings of the Seventeenth Vertebrate Pest Conference (eds Timms RM and Crabb AC), University of California, Davis, pp 1–12

Jansky L (2002) United Nations University Marks the International Year of Mountains. Mountain Research and Development, Volume 22, No. 3, pp 296–299

Jaquet S, Shrestha G, Kohler T, Schwilch G (2016) The Effects of Migration on Livelihoods, Land Management, and Vulnerability to Natural Disasters in the Harpan Watershed in Western Nepal**.** Mountain Research and Development, 36(4):494–505

Johansson Ö, McCarthy T, Samelius G, Andrén H, Tumursukh L, Mishra C (2015) Snow leopard predation in a livestock dominated landscape in Mongolia. Biological Conservation, Volume 184, pp 251–258

Juffe-Bignoli D, Burgess ND, Bingham H, Belle EMS, de Lima MG, et al. (2014) Protected Planet Report 2014. UNEP-WCMC, Cambridge, UK

Jumabay-Uulu K, Wegge P, Mishra C, Sharma K (2013) Large carnivores and low diversity of optimal prey: a comparison of the diets of snow leopards Panthera uncia and wolves *Canis lupus* in Sarychat-Ertash Reserve in Kyrgyzstan. Fauna & Flora International, Oryx

Kabar News Agency (2017) Kontrabanda v Sary-Tashe. Voditel spryatal pod ovchinoi shkuru i roga arkharov i kozerogov (Smuggling in Sary-Tash. The driver hid the skin and horns of argali and ibex under a sheepskin). Accessed on 29.04.2017 at http://kabar.kg/news/kontrabanda-v-sary-tashe-voditel-spriatal-pod-ovchinoi-shkuru-i-roga-arkharov-i-kozerogov/

Kadyrov M (2020) Hab “At-Bashy”: opaseniya mestnykh zhitelei I pozitsiya pravitelstva (The At-Bashy Hub: Residents' Concerns and Government Position). Retrieved on 10.02.2020 https://rus.azattyk.org/a/narynchane-vystupili-protiv-stroitelstva-logisticheskogo-centra-at-bashi/30377772.html

Kamler JF, Songsasen N, Jenks K, Srivathsa A, Sheng L, Kunkel K (2015) Cuon alpinus. The IUCN Red List of Threatened Species 2015: e.T5953A72477893

Kansky R, Knight AT (2014) Key factors driving attitudes towards large mammals in conflict with humans. Biological Conservation 179, pp 93–105

Karashev AA, Tarbinsky OS, Shadybekov KB (2004) Organizatsionno-pravovye osnovy mestnogo samoupravlenia v Kyrgyzstane (Organisational and legal base of local self-government in Kyrgyzstan). Academy of Management under the President of the Kyrgyz Republic, Hanns Seidel Foundation, Bishkek

Karaulov NA (1935) Gidroenergeticheskie resursy rr. Naryn i Chu (Hydropower resources of the rivers Naryn and Chu) In: Fersman AE, Gorbunov NP, Scherbakov DI, Nalivkin DV et al. (eds) Tadzhiksko-Pamirskaya ekspeditsiya 1934 (Tajik-Pamirian Expedition in 1934). Academy of Science of the USSR, Moscow-Leningrad

Kashkarov EP (2017) Snezhnyi bars Kirgizii: natsionalnyi styd ili natsionalnaya gordost? (Snow leopard of Kyrgyzia: national shame or national pride?). Rossiyskie region: vzglyad v budushee, No. 2 pp 239–263

Kearns C (2010) Conservation of Biodiversity. Nature Education Knowledge, 3(10):7

Kerimbekova N (2002) Kyrgyzsko-kitaiskaya granitsa: istoricheskie dokumenty i nauchnye raboty (Kyrgyz-Chinese border: historical documents and scientific works). Bishkek

Kerven C, Alimaev II, Behnke R, Davidson G, et al. (2004) Retraction and expansion of flock mobility in Central Asia: costs and consequences. African Journal of Range & Forage Science, 21(3):159-169

Kerven C, Steimann B, Dear C, Ashley L (2012) Researching the Future of Pastoralism in Central Asia's Mountains: Examining Development Orthodoxies. Mountain Research and Development, 32(3):368–377

Kharel F (1997) Agricultural Crop and Livestock Depredation by Wildlife in Langtang National Park, Nepal. Mountain Research and Development, Volume 17, No.2, pp 127–134

Kharin N (2002) Vegetation Degradation in Central Asia under the Impact of Human Activities. Springer science + Business Media New York

Kharitonov EV (2009) Biologiya i khozyaistvennoe ispolzovanie pamirskogo barana (*Ovis ammon* polii) aftoreferat (Biology and economical use of Pamirian sheep (*Ovis ammon*) essay). Ministry of Education of the Russian Federation, Vyatka State Agricultural Academy, Kirov

Kochetkov VV (2018) New aspect in understanding the biocenotic role of domestic ungulates in the life of wolf (*Canis lupus L.*). Russian Journal of Ecology, Volume 49, No.2, pp 152–159

Kollmair M, Gurung GS, Hurni K, Maselli D (2005) Mountains: Special places to be protected? An analysis of worldwide nature conservation efforts in mountains. International Journal of Biodiversity Science and Management, 1:4, pp 181–189

König HJ, Kiffner C, Kramer-Schadt S, Fürst C, Keuling O, Ford AT (2020) Human–wildlife coexistence in a changing world. Conservation Biology, 34, pp 786–794

Koshkarev E (2002) Valutnye barany i ministerskie volki Kirgizii (Currency rams and ministerial wolves of Kyrgyzstan). Okhrana dikoi prirody No. 1(24)

Koshkarev EP (1989) Snezhnyi bars v Kirgizii (Snow leopard in Kyrgyziya). Ilim, Frunze

Kostenko Y (2018) Turizm razvivaem? Alpinisty bolshe ne smogut podnimatsya na pik Khan-Tengri (Are we developing tourism? Mountaineers will no longer be able to climb Khan Tengri Peak). https://24.kg/obschestvo/89600/ accessed 08.08.2018

Kozlovsky E (1928) Krasnaya armiya v Srednei Azii. Voenno-istorichesky ocherk (Red Army in Central Asia. Military history essay). Tashkent

Kraudzun T (2012) Livelihoods of the 'New Livestock Breeders' in the Eastern Pamirs of Tajikistan. In: Kreutzmann H (ed) Pastoral practices in High Asia, Advances in Asian Human-Environmental Research. Springer Science + Business Media B.V.

Kraudzun T (2016) External Support and Local Agency: Uncertain Transformations of Livelihoods in the Pamirian Borderland of Tajikistan. In: Kreutzmann H, Watanabe T (eds) Mapping Transition in the Pamirs. Advances in Asian Human-Environmental Research. Springer, Cham

Kreutzmann H (1995) Globalization, Spatial Integration, and Sustainable Development in Northern Pakistan. Mountain Research and Development, Vol. 15, No. 3, Geoecology and Sustainable Development in Middle Mountains and High Mountains, International Mountain Society, pp 213–227

Kreutzmann H (1996) Siedlungsprozesse und territoriale Aneignung im zentralen Hunza-Tal: Kulturgeographische Anmerkungen zur Karte "Hunza-Karakorum 1: 100 000" (Settlement Processes and Spatial Appropriation in the Central Hunza Valley. Cultural-Geographical Remarks for the "Hunza-Karakorum 1: 100 000" Map). Erdkunde, Bd. 50, H. 3, pp 173–189

Kreutzmann H (2004) Ellsworth Huntington and his perspective on Central Asia. Great game experiences and their influence on development thought. GeoJournal, 59:27–31

Kreutzmann H (2011) Pastoralism in Central Asian Mountain Regions. In: Kreutzmann H, Abdulalishoev K, Zhaohui L, Richter J (eds) Regional workshop in Khorog and Kashgar. Pastoralism and rangeland management in mountain areas in the context of climate and global change. GIZ, Bonn

Kreutzmann H (2012) Pastoral Practices in Transition: Animal Husbandry in High Asian Contexts. In: Kreutzmann H (ed) Pastoral practices in High Asia, Agency of 'development' effected by modernisation, resettlement and transformation. Springer, pp 1–29

Kreutzmann H (2013a) Recent results from pastoralism research and development practice. Études mongoles et sibériennes, centrasiatiques et tibétaines, 43–44

Kreutzmann H (2013b) The tragedy of responsibility in high Asia: modernizing traditional pastoral practices and preserving modernist worldviews. Pastoralism: Research, Policy and Practice, 3(7)

Kreutzmann H (2015) Pamirian Crossroads: Kirghiz and Wakhi of High Asia. Wiesbaden: Harrassowitz Verlag

Kreutzmann H (2016a) From Upscaling to Rescaling: Transforming the Fergana Basin from Tsarist Irrigation to Water Management for an Independent Uzbekistan. In: Hüttl R, Bens O, Bismuth C, Hoechstetter S (eds) Society-Water-Technology. Water Resources Development and Management. Springer, Cham

Kreutzmann H (2016b) Pamirian Spaces: Mapping Process Geographies in the Mountainous Periphery. In: Kreutzmann H, Watanabe T (eds) Mapping Transition in the Pamirs. Advances in Asian Human- Environmental Research. Springer, Cham

Kreutzmann H (2017) Historical geography of the Pamirs. In: Ludden D (ed) Research Encyclopedia of Asian History. Oxford, United Kingdom: Oxford University Press

Kreutzmann H, Stadel C (2000) Mountain peoples. In: Price MF, Butt N (eds) Forests in sustainable mountain development: A state of knowledge report for 2000. IUFRO research series 5. Oxon, New York, pp 85–90

Kreutzmann H, Watanabe T (2016) (eds) Mapping Transition in the Pamirs. Advances in Asian Human-Environmental Research. Springer, Cham

Kumushaliev BK (2006) Lutra lutra Linnaeus, 1758. In: Davletkeldiev AA, Shukurov ED, Chyngozhoev AT, Burkhanov AM, Mamatov SM (eds) Krasnaya kniga Kyrgyzskoi Respubliki (Red Book of Kyrgyz Republic). State Agency on Environmental Protection and Forestry under the Government of Kyrgyz Republic. Institute for Biology and Pedology, National Academy of Sciences of Kyrgyz Republic, Ecological Movement “Aleine” of Kyrgyzstan. Second edition, Bishkek, 544 p. – Text in Kyr., Rus., Eng. Languages

Kuznetsov BA (1948) Zveri Kirgizii (Animals of Kyrgyzia). MOIP, Moskva

Kyrgyz Statistic Department (1928) Izdanie Kirgizskogo Statisticheskogo Upravleniya. Dzhut 1927-1928 g. (Publication of Kyrgyz Statistic Department. Zhut 1927-1928). Kirgosizdat, Frunze

KYRGYZGIPROZEM Kyrgyzsky Gosudarstvennyi Proektnyi Institut po Zemleustoistvu (Kyrgyz State Project Institute for Land Management), Gosudarstvennyi Agropromyshlennyi Komitet Kirgizskoi SSR (State Committee for Agroindustry of the Kyrgyz SSR), Oshsky filial (Osh branch) (1988) Skhema poetapnogo vozvrata zemel dolgosrochnogo polzovania Uzbekskoi SSR i Tadzhikskoi SSR na territorii Oshskoi oblasti Kirgizskoi SSR (Scheme of the phased return of long-

term land use of the Uzbek SSR and the Tajik SSR on the territory of the Osh oblast of the Kyrgyz SSR), inventory number – 11689, attached map [Poetapnoe izyatie zemel, 1:500,000]. Osh

Lafon M (2007) Immunology. In: Jackson AC, Wunner WH (eds) Rabies (Second Edition), Academic Press

Laruelle M, Huchet JF, Peyrouse S, Balci B (2010) (eds) China and India in Central Asia: A New "Great Game". Palgrave Macmillan, New York

Lausche B (2011) Guidelines for Protected Area Legislation. IUCN, Gland, Switzerland

Le Bel S, Mapuvire G, Czudek R (2010) Human-Wildlife Conflict Toolkit: comprehensive solutions for farmers and communities. Unasylva, 236, Vol.61

Le Billon P (2015) Environmental conflict. In: Perreault T, Bridge G, McCarthy J (eds) The Routledge Handbook of Political Ecology. Routledge

Leader-Williams N, Hutton JM (2005) Does extractive use provide opportunities to offset conflicts between people and wildlife? In: Woodroffe R, Thirgood S, Rabinowitz A (eds) People and wildlife: conflict or coexistence? Cambridge University Press, Cambridge, pp 140–161

Lelyveld M (2017) China's Gas Plans Unsettled by Oversupply. http://www.rfa.org/english/commentaries/energy_watch/chinas-gas-plans-unsettled-by-oversupply-08142017104724.html. Accessed on 27.09.2017

Leonov NI (1951) Vpervye v Alai (For the first time to the Alai). DETGIZ, Moskva-Leningrad

Leonov NI (1972) Aleksei Pavlovich Fedchenko 1844-1873. Nauka, Moskva

Leopold A (1986) Game Management. University of Wisconsin Press

Lescureux N (2006) Towards the necessity of a new interactive approach integrating ethnology, ecology, and ethology in the study of the relationship between Kyrgyz stockbreeders and wolves. Social Science Information Sur Les Sciences Sociales, 45 (4), pp 463–478

Lescureux N and Linnell J (2013) The effect of rapid social changes during post-communist transition on perceptions of the human-wolf relationships in Macedonia and Kyrgyzstan. Pastoralism: Research, Policy and Practice, 3(4)

Lim M (2012) Laws, institutions and transboundary pasture management in the High Pamir and Pamir-Alai Mountain ecosystem of Central Asia. Law, Environment and Development Journal, 8(1):45–58

Lindner P (2008) Der Kolchoz-Archipel im Privatisierungsprozess Wege und Umwege der russischen Landwirtschaft in die globale Marktgesellschaft. Transcript Verlag

Linnell J, Odden J, Smith M, Aanes R, Swenson J (1999) Large Carnivores That Kill Livestock: Do "Problem Individuals" Really Exist? Wildlife Society Bulletin, Volume 27, No. 3, pp 698–705

Linnell JDC, Alleau J (2016) Predators That Kill Humans: Myth, Reality, Context and the Politics of Wolf Attacks on People. In: Angelici F (ed) Problematic Wildlife. Springer, Cham

Linnell JDC, Lescureux N (2015) Livestock guarding dogs–cultural heritage icons with a new relevance for mitigating conservation conflicts. Norwegian Institute for Nature Research, Trondheim, pp 76

Liu J, Watanabe T (2016) Seasonal Pasture Use and Vegetation Cover Changes in the Alai Valley, Kyrgyzstan. In: Kreutzmann H, Watanabe T (eds) Mapping Transition in the Pamirs. Advances in Asian Human-Environmental Research. Springer, Cham

Lkhagvasuren B, Adiya Y, Tsogtjargal G, Amgalanbaatar G, Harris R (2016) Current Status and Conservation of Mountain Ungulates in Mongolia. Erforschung biologischer Ressourcen der Mongolei / Exploration into the Biological Resources of Mongolia, (13): 445–456

Luknitsky P (1955) Puteshestvie po Pamiru (Travel on the Pamir). Moscow, USSR: Izdanie CKVLKSM, Molodaya Gvardiya

Lushchikhin MN (1982) Zhivotnovodstvo (Animal husbandry). In: Oruzbaeva BO (ed) Kirgizskaya Sovetskaya Sotsialisticheskaya Respublika. Entsiklopediya. Akademiya Nauk Kirgizskoi SSR, Gosudarstvennyi Komitet Kirgizskoi SSR po delam izdatelstv, poligrafii i knizhnoi torgovli. (Kyrgyz Soviet Socialist Republic. Encyclopaedia. Academy of Sciences of the Kyrgyz SSR, State Committee of the Kyrgyz SSR for Publishing, Printing and Book Trade). Glavnaya Redaktsiya Kirgizskoi Sovetskoi Entsiklopedii, Frunze, pp 214–217

Lushchikhina EM (2007) Merinosovoe ovtsevodstvo Kyrgyzstana (Merino sheep breeding in Kyrgyzstan). Sbornik nauchnykh trudov Vserossiyskogo nauchno-issledovatelskogo instituta ovtsevodstva i kozovostva, 1(1-1), pp 101–108

Madden F (2004) Creating Coexistence between Humans and Wildlife: Global Perspectives on Local Efforts to Address Human-Wildlife Conflict, Human Dimensions of Wildlife, 9(4), pp 247–257

Maikhuri RK, Rao KS, Anarbaev M, Safaralikhonov A, Saxem KG, Liang L (2015) Farming and Environmental Conservation in Asian Cold Deserts: A Review. International Journal of Ecology and Environmental Sciences, Volume 41(3-4), pp 217–241

Malabaev D (1982) Kollektivizatsiya selskogo khozyaistva i perekhod ot kochevnichestva k osedlosti (Collectivisation and agriculture and the transition from nomadism to sedentariness). In: Oruzbaeva BO (ed) Kirgizskaya Sovetskaya Sotsialisticheskaya Respublika. Entsiklopediya.

Akademiya Nauk Kirgizskoi SSR, Gosudarstvennyi Komitet Kirgizskoi SSR po delam izdatelstv, poligrafii i knizhnoi torgovli. (Kyrgyz Soviet Socialist Republic. Encyclopaedia. Academy of Sciences of the Kyrgyz SSR, State Committee of the Kyrgyz SSR for Publishing, Printing and Book Trade). Glavnaya Redaktsiya Kirgizskoi Sovetskoi Entsiklopedii, Frunze, pp 144–146

Mallon D (2013) Trophy Hunting of CITES-listed species in Central Asia. Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Geneva, Switzerland

Mambetov B (2006) Vsemi zabytyi Sary-Mogol (Forgotten by all Sary-Mogol). MSN Newspaper, date of issue 28.11.2006. Retrieved on 19.11.2014 at http://www.msn.kg/ru/news/16349/

Mamytov A (1987) Utilization and conservation of land resources of the mountains of Central Asia and Southern Kazakhstan. In: Manzoor Alam S, Habeeb Kidwai A (eds) Regional Imperatives in Utilization and Management of Resources: India and the USSR. New Delhi

Mamytov AM, Zamoshnikov VD, Vorobyov GG, Pasechnik ST (eds) (1985) Krasnaya Kniga Kirgizskoi SSR. Redkie i nakhodyaschiesya pod ugrozoi ischeznoveniya vidy zhyvotnykh i rasteniy (Red Book of Kyrgyz SSR. Rare and endangered species of animals and plants). Gosudarstvennyi komitet Kirgizskoi SSR po lesnomu khosyaistvu (State Committee on Forestry of Kyrgyz SSR), Goskomizdat, Frunze

Marchini S (2014) Who's in Conflict with Whom? Human Dimensions of the Conflicts Involving Wildlife. In: Verdade L, Lyra-Jorge M, Piña C (eds) Applied Ecology and Human Dimensions in Biological Conservation. Springer, Berlin, Heidelberg

Marchini S, Macdonald DW (2012) Predicting ranchers' intention to kill jaguars: Case studies in Amazonia and Pantanal. Biological Conservation, Volume 147, Issue 1, pp 213–221

Markov E (1901) Rossiya v Srednei Azii (Russia in Middle Asia). Otcherki puteshestviya po zakavkasiu, Turkmenii, Bukhare, Samarkandskoi, Tashkentskoi i Ferganskoi oblastyam, Kaspiiskomu moryu i Volgi (Essays on travel to the Zakavkaz, Turkmeniya, Bukhara, Samarkand, Tashkent and Fergana regions, the Caspian Sea and the Volga). Tom II, Parts IV, V and VI, Saint-Petersburg

Markovsky AP (1935) Geologicheskie raboty na Pamire letom 1933 goda (Geological works in the Pamir in the summer of 1933). In: Fersman AE, Gorbunov NP, Scherbakov DI, Nalivkin DV et al. (eds) Tadzhiksko-Pamirskaya ekspeditsiya 1934 (Tajik-Pamirian Expedition in 1934). Academy of Science of the USSR, Moscow–Leningrad

Mathieu J (2011) The third dimension. A comparative history of mountains in the modern era. The White Horse Press, Cambridge

McCarthy T, Mallon D, Jackson R, Zahler P, McCarthy K (2017) Panthera uncia. The IUCN Red List of Threatened Species 2017: e.T22732A50664030

McCarthy TM, Mallon DP (2016) (eds) Snow Leopards Biodiversity of the World: Conservation from Genes to Landscapes. Elsevier, New York

Mech LD (1999) Alpha status, dominance, and division of labor in wolf packs. Canadian Journal of Zoology 77:1196–1203

Miller B, Dugelby B, Foreman D, del Rio CM, Noss R et al. (2001) The importance of large carnivores to healthy ecosystems. Endangered Species Update, 18 (5)

Miller G (2014) O 66-ti godakh zhizni sovetskogo nemtsa v Sovetskom Soiuze, (1928-1994) (About 66 years of life of soviet German in the Soviet Union, 1928-1994) ISBN-10:1291689621

Milton K (1993) (ed) Environmentalism. The view from anthropology. ASA Monographs 32. Routledge

Minagro Ministry of Agriculture, Food Industry and Melioration of the Kyrgyz Republic (2016) Kontseptsiya sokhraneniya i povysheniya plodorodiya pochv Kyrgyzskoi Respubliki na 2017-2020 gody (The concept of preserving and increasing soil fertility in the Kyrgyz Republic for 2017-2020 years)

Mineconom Ministry of Economy of the Kyrgyz Republics (2014) Srednesrochnaya i dolgosrochnaya strategiya razvitiya gornodobyvaiuschei promyshlennosti Kyrgyzskoi Respubliki (Medium and long-term strategy for the development of the mining industry in the Kyrgyz Republic), Bishkek

Ministry of Environmental Protection (1998) Kyrgyz Republic Biodiversity Strategy and Action Plan. MEP, Bishkek

Ministry of Foreign Affairs of the Kyrgyz Republic (2021) The UN General Assembly unanimously adopted a new resolution initiated by the Kyrgyz Republic entitled "Nature knows no borders: transboundary cooperation – a key factor for biodiversity conservation, restoration and sustainable use". See https://mfa.gov.kg

Mishra C (1997) Livestock depredation by large carnivores in the Indian Trans-Himalaya: conflict perceptions and conservation prospects. Environmental Conservation 24:338–343

Mishra C (2001) High altitude survival: conflicts between pastoralism and wildlife in the Trans-Himalaya. Ph.D. thesis, Wageningen University, Netherlands

Mishra C, Allen P, McCarthy T, Madhusudan MD et al. (2003) The Role of Incentive Programs in Conserving the Snow Leopard. Conservation Biology, Volume 17, No. 6, pp 1512–1520

Mishra C, Bhatnagar YV, Trivedi P, Timbadia R, Bijoor A et al. (2016) The role of village reserves in revitalizing the natural prey base of the snow leopard. In: McCarthy T, Mallon D (eds) Snow Leopards. Biodiversity of the World: Conservation from Genes to Landscapes. Elsevier, pp 184–195

Mishra C, Wieren S, Ketner P, Heitkönig I, Prins H (2004) Competition between domestic livestock and wild bharal *Pseudois nayaur* in the Indian Trans-Himalaya. Journal of Applied Ecology 41, pp 344–354

Mittermeier RA, Turner WR, Larsen FW, Brooks TM, Gascon C (2011) Global Biodiversity Conservation: The Critical Role of Hotspots. In: Zachos F, Habel J (eds) Biodiversity Hotspots. Springer, Berlin, Heidelberg

Mushketov IV (1886) Turkestan. Geologicheskoe i orograficheskoe opisanie po dannym sobrannym vo vremya puteshestviy s 1874 g. po 1880 (Turkestan. Geological and orographical description based on collected data during the travel in 1874–1880). Volume 1. S. Peterburg

National Bank of the Kyrgyz Republic (2018) Denezhnye perevody fizicheskikh lits, osuschestvlyaemye cherez sistemy perevodov (Individual money transfers via transfer systems), Bishkek

National Council for Sustainable Development of the Kyrgyz Republic (2013) Natsionalnaiya Strategiya dlya Ustoichivogo Razvitiya Kyrgyzskoi Respubliki na 2013-2017 g. (National Strategy for Sustainable Development of the Kyrgyz Republic for 2013–2017), Bishkek

National Council for Sustainable Development of the Kyrgyz Republic (2018) Natsionalnaiya Strategiya Razvitiya Kyrgyzskoi Respubliki na 2018-2040 gody (National Strategy for Development of the Kyrgyz Republic for 2018–2040 years), Bishkek

NatStatCom National Statistic Committee of the Kyrgyz Republic (2010) Perepis naselenia i zhilischnego fonda Kyrgyzskoi Respubliki 2009 goda. Regiony Kyrgyzstana. Oshskaya oblast (Population and Housing Census of the Kyrgyz Republic in 2009. Regions of Kyrgyzstan. Osh oblast), Bishkek

NatStatCom National Statistic Committee of the Kyrgyz Republic (2015) Statistichesky ezhegodnik Kyrgyzskoi Respubliki 2010-2014 (Statistical Yearbook of the Kyrgyz Republic), Bishkek

NatStatCom National Statistic Committee of the Kyrgyz Republic (2016a) VVP po vidam ekonomicheskoi deyatelnosti v yanvare-noyabre 2016 (GDP by economic activity in January-November 2016). http://www.stat.kg/ru/news/vvp-po-vidam-ekonomicheskoj-deyatelnosti-v-yanvare-oktyabre-2016-goda/ accessed on 14.12.2016

NatStatCom National Statistic Committee of the Kyrgyz Republic (2016b) Promyshlennost Kyrgyzskoi Respubliki 2011-2015 (Industry of the Kyrgyz Republic 2011-2015). Bishkek

NatStatCom National Statistic Committee of the Kyrgyz Republic (2018) Informatsionnyi biulleten Kyrgyzskoi Respubliki po prodovolstvennoi bezopasnosti i bednosti (Newsletter of the Kyrgyz Republic on food security and poverty), Bishkek

NatStatCom National Statistic Committee of the Kyrgyz Republic (2017) Selskoe khozyaistvo Kyrgyzskoi Respubliki (The agriculture of the Kyrgyz Republic), Bishkek

NatStatCom National Statistic Committee of the Kyrgyz Republic (2019) Kyrgyzstan v tsyfrakh (Kyrgyzstan in numbers), Bishkek

NatStatCom National Statistic Committee of the Kyrgyz Republic (2008) 1.05.02.13 Pogolovie skota i ptitsy po kategoriyam khozyaistv i territorii 1990-2007 (Livestock and poultry numbers in all categories and territory in 1990-2007), Bishkek

NatStatCom National Statistic Committee of the Kyrgyz Republic (2020) Uroven bednosti naseleniya Kyrgyzskoi Respubliki v 2019 godu (Poverty rate of the population of the Kyrgyz Republic in 2019), Bishkek

Nawaz M, Din JU, Shah SA, Khan A (2016) Trophy Hunting as a Conservation Tool for Snow Leopards. In: McCarthy T, Mallon D (eds) Snow Leopards. Biodiversity of the world: Conservation from genes to landscapes. Elsevier, pp 219–244

Nazarov SA (1965) Iz istorii deyatelnosti Sredazbiuro TsK VKPb (1922-1924 gody) (From the history of the activities of Sredazbureau in 1922-1924). Izdatelstvo Uzbekistan, Tashkent

Ndam N, Healey JR, Acworth J, Tchouto PG (2000) Case study: Biodiversity on Mount Cameroon. In: Price MR, Butt N (eds) Forests in sustainable mountain development: a state of knowledge report for 2000. IUFRO research series, Oxon, New York

Nellemann C; Henriksen R, Kreilhuber A, Stewart D et al. (eds) (2016) The Rise of Environmental Crime – A Growing Threat to Natural Resources Peace, Development and Security. A UNEP-INTERPOL Rapid Response Assessment. United Nations Environment Programme and RHIPTO Rapid Response–Norwegian Center for Global Analyses

Neumann PR (2015) Nature conservation. In: Perreault T, Bridge G, McCarthy J (eds) The Routledge Handbook of Political Ecology. Routledge

Niamir-Fuller M, Kerven C, Reid R, Milner-Gulland E (2012) Co-existence of wildlife and pastoralism on extensive rangelands: competition or compatibility? Pastoralism: Research. Policy and Practice, 2(8)

Nilsen EB, Milner-Gulland EJ, Schofield L, Mysterud A, Stenseth NC, and Coulson T (2007) Wolf reintroduction to Scotland: public attitudes and consequences for red deer management. Proceedings. Biological sciences, 274 (1612), pp 995–1002

Nordbø I, Turdumambetov B, Gulcan B (2018) Local opinions on trophy hunting in Kyrgyzstan, Journal of Sustainable Tourism, 26:1, 68–84

Novikov GA (1956) Khishnye mlekopitaiushie fauny SSSR (Predatory mammals of the fauna of the USSR). Izdatelstvo Akademiya Nauk SSSR, Moskva–Leningrad

Nowak RM (1995) Another look at wolf taxomony. In: Carbyn LN, Fritts SH, Seip DR (eds) Ecology and Conservation of Wolves in a Changing World. Edmonton, Alberta: Canadian Circumpolar Institute, Volume 35, pp 375–397

Nyhus PJ (2016) Human-Wildlife Conflict and Coexistence. Annu. Rev. Environ. Resour. 41:143–71

Ogada MO (2015) HWC 2003 + 10 Years: Carnivore-Livestock Conflicts, Tourism, Donors, Compensation: What About the Human Dimensions?. Human Dimensions of Wildlife, 20:4, pp 329–332

Oli MK, Taylor IR, Rogers ME (1994) Snow leopard Panthera uncia predation of livestock: An assessment of local perceptions in the Annapurna Conservation Area, Nepal. Biological Conservation, Volume 68:1, pp 63–68

Olson DM, Dinerstein E (2002) The Global 200: Priority Ecoregions for Global Conservation. Annals of the Missouri Botanical Garden, Volume 89, No. 2, pp 199–224

Osh Regional Department of State Statistics (2021) Sotsialno-ekonomicheskoe polozhenie Oshskoi oblasti (Socio-economic situation of Osh oblast), Osh

Ostermann-Miyashita EF, Pernat N, König HJ (2021) Citizen science as a bottom-up approach to address human–wildlife conflicts: From theories and methods to practical implications. Conservation Science and Practice

Parmanasov DM (1979) Povyshenie effektivnosti intensifikatsii kormoproizvodstva v vysokogonych dolinakh Kirgizii (na primere Alaiskoi doliny) avtoreferat (Increasing the efficiency

of intensification of forage production in the high-mountainous valleys of Kyrgyzstan (on the example of the Alai Valley) essay). Akademiya Nauk Kirgizskoi SSR, Institut Ekonomi. Frunze

Pavlov MP (1990) Volk (The Wolf). VO Agropromizdat, Moscow

Peet R, Robbins P, Watts MJ (2011) (eds) Global Political Ecology. Routledge, London and New York

Peet R, Robbins P, Watts MJ (2011) Global nature. In: Peet R, Robbins P, Watts MJ (eds) Global Political Ecology. Routledge, London and New York

Penkina LM (2004) Estestvennye pastbischa i etnokulturnye traditsii (Natural pastures and ethnocultural traditions), Kyrgyzsky Gosudarstvennyi Proektnyi Institut po Zemleustoistvu "KYRGYZGIPROZEM", Bishkek

Perreault T, Bridge G, McCarthy J (2015) The Routledge Handbook of Political Ecology (1st ed.). Routledge

Peterson MN, Birckhead JL, Leong K, Peterson MJ, Peterson TR (2010) Rearticulating the myth of human–wildlife conflict. Conservation Letters, 3: 74–82

Petr T, Mitrofanov VP (1998) The impact on fish stocks of river regulation in Central Asia and Kazakhstan. Lakes & Reservoirs: Research & Management, 3: 143–164

Pimlott DH (1975) (ed) Wolves. Proceedings of the first working meeting of wolf specialists and of the first international conference on the conservation of the wolf. International Union for Conservation of Nature and Natural Resources, Morges, Switzerland

Pimpare S (2015) Youthxchange Biodiversity and Lifestyles Guidebook. UNESCO and UNEP, A United Nations Publication

Piskunov S (2000) Borba s basmachami v Srednei Azii 1918-1938 gody (Struggle with the basmachis in the Middle Asia in 1918-1938). Retrieved on 05.11.2015 at www.hrono.ru/sobyt/1900war/1918basm.php

Pomfret G (2006) Mountaineering adventure tourists: a conceptual framework for research. Tourism Management, 27(1):113–123

Priklonsky SG (1985) Vozdeistvie volka na domashnikh zhyvotnykh (The impact of the wolf on domestic animals). In: Bibikov DI (ed) Volk. Proiskhozhdenie, sistematika, morfologiya, ekologiya (The Wolf. History, Systematics, Morphology, Ecology). Izdatelsvto Nauka, Moscow

Ramutsindela M, Noe C (2015) Bordering and scalar thickening in nature conservation. In: Bryant RL (ed) The International Handbook on Political Ecology. Cheltenham, Edward Elgar, pp 501–514

Rashid A (2000) Taliban, Islam, Oil and New Great Game in Central Asia. I.B. Tauris, London

Ravenelle J, Nyhus PJ (2017) Global patterns and trends in human-wildlife conflict compensation. Conserv Biol. 31(6):1247–1256

Reimers NF, Bibikov DI (1985) Areal i ego izmenenie (Areal and its change). In: Bibikov DI (ed) Volk. Proiskhozhdenie, sistematika, morfologiya, ekologiya (The Wolf. History, Systematics, Morphology, Ecology). Izdatelsvto Nauka, Moscow

RIA Novosti News Agency (2013) Vlasti Kirgizii: sluchai chumy ne sozdaet ugrozy epidemii (Kyrgyz authorities: plague cases do not pose an epidemic threat) https://ria.ru/20130828/959211366.html?in=t accessed on 10.10.2018

Rickmer-Rickmers, W (1930) Alai! Alai! Arbeiten und Erlebnisse einer deutsch-russischen Alai-Pamir-Expedition. Brockhaus-Verlag, Leipzig

Rieger I (1984) Tail functions in ounces, *Uncia uncia*. In: Blomqvist L (ed) International Pedigree Book of Snow Leopards, *Panthera uncia*, 4, Helsinki Zoo, Helsinki, pp 85–97

Ritchie H, Roser M (2020) Land Use. Published online at OurWorldInData.org

Robbins P (2004) Political Ecology: A Critical Introduction. Blackwell

Rodríguez-Rodríguez D, Bomhard B (2012) Mapping Direct Human Influence on the World's Mountain Areas. Mountain Research and Development, 32(2), pp 197–202

Rosen T (2012) Analyzing gaps and options for enhancing argali conservation in Central Asia within the context of the convention on the conservation of migratory species of wild animals. CMS Bonn, Germany and the GIZ Regional Program on Sustainable Use of Natural Resources in Central Asia

Rosen T, Hussain S, Mohammad G, Jackson R, Janecka JE, Michel S (2012) Reconciling Sustainable Development of Mountain Communities with Large Carnivore Conservation. Mountain Research and Development, 32(3):286-293

Rovero F, Augugliaro C, Havmøller R, Groff C, Zimmermann F, Oberosler V, Tenan S (2018) Co-occurrence of snow leopard Panthera uncia, Siberian ibex Capra sibirica and livestock: Potential relationships and effects. Oryx, 1-7

Rukovsky NN (1985) Pitanie i biotsenoticheskie otnosheniya. Pitanie (Feeding and biocoenotic relationships. Feeding). In: Bibikov DI (ed) Volk. Proiskhozhdenie, sistematika, morfologiya, ekologiya (The Wolf. History, Systematics, Morphology, Ecology). Izdatelsvto Nauka, Moscow

Sagynbekova L (2016) The Impact of International Migration. Process and Contemporary Trends in Kyrgyzstan. Springer

Saidov A, Karimov K, Amirov Z, Rosen T (2016) Central Asia: Tajikistan. In: McCarthy T, Mallon D (eds) Snow Leopards. Biodiversity of the world: Conservation from genes to landscapes. Elsevier, pp 433–437

Saktaganova ZG (2012) D. A. Kunaev i porblemy izmeneniya granitsy Kazakhstana (D. A. Kunaev and problems of borderline changes of Kazakhstan. Vestnik, Karaganda State University, Karaganda. http://articlekz.com/article/5951 accessed on 15.10.15

Samuel II (1935) "INTERGELPO" Chekhoslavatsky promislovyi kooperativ v Kirgizii (INTERHELPO Czechoslovakian industrial cooperative in Kyrgyziya). VKO Izdatelstvo, Moskow-Leningrad

Sangay T, Vernes K (2008) Human–wildlife conflict in the Kingdom of Bhutan: Patterns of livestock predation by large mammalian carnivores. Biological Conservation 141:1272–1282

Schaller G, Kang A (2008) Status of Marco Polo sheep *Ovis ammon polii* in China and adjacent countries: Conservation of a Vulnerable subspecies. Oryx, 42(1), pp 100–106

Schaller GB (2012) Tibetan Wild Sheep Scandal. In: Tibet Wild. Island Press, Washington, DC

Schmidt M (2008) Political Ecology in High Mountains: the Web of Actors, Interests and Institutions in Kyrgyzstan's Mountains. Colloquium Geographicum 31:139-154

Schmidt M (2009) Local needs versus global demands for the walnut-fruit forests of Kyrgyzstan. In: Gacek T, Pstrusinska J (eds) Proceedings of the Ninth Conference of the European Society for Central Asian Studies (pp. 353–372). Newcastle: Cambridge Scholars

Schmidt M (2011) Central Asia's Blue Pearl: The Issyk Kul Biosphere Reserve in Kyrgyzstan. In: Schaaf T (ed) Biosphere Reserves in the Mountains of the World: Excellence in the Clouds?. Wien: Austrian Academy of Sciences Press, pp 73–76

Schmidt M (2012) Changing human-environment interrelationships in Kyrgyzstan's walnut-fruit forests. Forests, Trees and Livelihoods, Volume 21, Issue 4, pp 253–266

Schmidt M (2013) Mensch und Umwelt in Kirgistan – Politische Ökologie im postkolonialen und postsozialistischen Kontext. Erdkundliches Wissen 153. Stuttgart: Franz Steiner Verlag

Schmidt M, Doerre A (2011) Changing meanings of Kyrgyzstan's nut forests from colonial to post-Soviet times. Area 43(3), pp 288–296

Schoch N, Steimann B, Thieme S (2010) Migration and animal husbandry: Competing or complementary livelihood strategies. Evidence from Kyrgyzstan. Natural Resources Forum 34, pp 211–221

Schöffmann J (2001) Forellen in Zentralasien – dem östlichsten natürlichen Verbreitungsraum von Salmo trutta L. Österreichs Fischerei Jahrgang, 54, pp 54–58

Scholz F (2008) Nomadism. A socioecological mode of culture. International Institute for the Study of Nomadic Civilizations, Ulaanbaatar

Shahrani MN (2002) The Kirghiz and Wakhi of Afghanistan. Adaptation to Closed Frontiers and War. University of Washington Press, Seattle

Shan WJ, Liu YG (2016) The complete mitochondrial DNA sequence of the cape hare Lepus capensis pamirensis, Mitochondrial DNA Part A, 27:6, pp 4572–4573

Shanatibieke M (2015) The Road to Modernization: Sedentarisation and Its Impact on the Life and Livelihood of Kazakh Pastoralists in Xinjiang, China. PhD Dissertation, FU Berlin

Shapoval I (2000) The Ukrainina Years, 1894-1949. In: Taubman W, Khrushchev S, Gleason A (eds) Nikita Khrushchev. Yale University Press, New Haven and London

Sharma RK, Bhatnagar YV, Mishra C (2015) Does livestock benefit or harm snow leopards? Biological Conservation, Volume 190, pp 8–13

Shereshevsky EI (1953) Borzye i okhota s nimi (Sighthounds and hunting with them). Izdatelstvo Ministerstva s. kh. i zagotovok SSR, Moskow

Shirasaka S, Song F, Watanabe T (2016) Diversity of Seasonal Migration of Livestock in the Eastern Alai Valley, Southern Kyrgyzstan. In: Kreutzmann H, Watanabe T (eds) Mapping Transition in the Pamirs. Advances in Asian Human-Environmental Research. Springer, Cham

Shirasaka S, Watanabe T, Song F, Liu J, Miyahara I (2013) Transhumance in the Kyrgyz Pamir, Central Asia. Geographical Studies, Volume 88, No. 2

Shrestha R, Wegge P (2008). Wild sheep and livestock in Nepal Trans-Himalaya: Coexistence or competition? Environmental Conservation, 35(2), pp 125–136

Shtilmark FR (2005) Ideya absoliutnoi zapovednosti. Pomni praottsov – zapovednogo ne tron! (The idea of absolute conservation. Remember the forefathers – do not touch the protected!). Okhrana dikoi prirody. Kiev-Moscow

Shukurov ED (2016) Zoogeografia Kyrgyzstana (Zoogeography of Kyrgyzstan), BIOM-Aleyne, Bishkek

Sievers EW (2003) The post-Soviet decline of Central Asia: sustainable development and comprehensive capital. RoutledgeCurzon, New York

Sillero-Zubiri C, Sukumar R, Treves A (2007) Living with wildlife: The roots of conflict and the solutions. In: Macdonald D (ed) Key Topics in Conservation Biology. Blackwell, Oxford, pp 266–272

Sillero-Zubiri C, Switzer D (2004) Management of wild canids in human dominated landscapes. People and Wildlife Initiative. Wildlife Conservation Research Unit, Oxford University

Simberloff D (1998) Flagships, umbrellas, and keystones: Is single-species management passé in the landscape era?. Biological Conservation, Volume 83, Issue 3, pp 247–257

Snow Leopard Working Secretariat (2013) Global Snow Leopard and Ecosystem Protection Program Bishkek, Kyrgyz Republic

Sokolov EV (1986) Redkie i ischezaiushchie zhyvotnye. Mlekopitaiushchie (Rare and endangered animals. Mammals). Vysshaya shkola, Moscow

Sorg A, Bolch T, Stoffel M, Solomina O, Beniston M (2012) Climate change impacts on glaciers and runoff in Tien Shan (Central Asia). Nature Climate Change 2, pp 725–731

Sosnovsky IP (1987) Redkie i ischezaiuschie zhivotnye: po stranitsam Krasnoi knigi SSSR (Rare and endangered animals: by the pages of the Red Book of USSR). Energoatomizdat. Moskva

Springate-Baginski O, Blaikie PM (2007) (eds) Forests, People and Power, London: Earthscan

Sputnik News Agency (2017) Yuani v karmane, ili gostintsy iz Podnebesnoi (Yuan in the pocket, or Goodies from the China) https://uz.sputniknews.ru/politics/20170515/5409178/Mirzieev-itogi-vizit-kitai.html accessed on 16.05.2017

Sputnik News Agency (2019) Si Tszinpin vruchil vysshuiu gosnagradu etnicheskoi kyrgyzke (Xi Jinping presented the highest state award to an ethnic Kyrgyz woman) https://ru.sputnik.kg/video/20191001/1045854331/kitay-si-czinpin-nagrada-etnicheskaya-kyrgyz.html accessed on 02.10.2019

State Agency on Environmental Protection and Forestry (2008) Prikaz o korrektirovke taks i normativov dlya ischisleniya razmerov vzyskani za ushcherb, prichenennyi lesnomu khozyaistvu, resursam zhyvotnogo i rastitelnogo mira (Order on the adjustment of rates and standards for calculating the amount of the penalty for damage caused to forestry, resources of fauna and flora). Unpublished data

State Agency on Environmental Protection and Forestry (2009) Ekologichesky obzor Kyrgyzskoi Respubliki (Ecological Overview of the Kyrgyz Republic), Bishkek

State Agency on Environmental Protection and Forestry (2011) Informatsiya po otstrelu khishchnykh zhyvotnykh. Unpublished report

State Agency on Environmental Protection and Forestry (2016) Natsionalnyi doklad o sostoyanii okruzhaiuschei sredy Kyrgyzskoi Respubliki za 2011-2014 gody (National environmental report of the Kyrgyz Republic for 2011-2014). Bishkek

State Agency on Environmental Protection and Forestry (2018) Uchet chislennosti krasnoknizhnykh zhyvotnykh (Count of the Red List species). Unpublished report

State Agency on Environmental Protection and Forestry (2019) Osobookhranyaemye prirodnye territorii (Specially Protected Areas). Unpublished data

State Agency on Environmental Protection and Forestry (2020) Informatsiya po okhotnichim vidam (Information about game species), unpublished report, Bishkek

State Agency on Environmental Protection and Forestry (2020) Okhotniche khozyaistvo i okhota (Hunting company and hunting). Unpublished report

Steimann B (2011) Making a living in uncertainty: agro-pastoral livelihoods and institutional transformations in post-socialist rural Kyrgyzstan. Human Geography Series 26, Bishkek and Zurich

Støen OG, Ordiz A, Sahlén V, Arnemo JM, Sæbø S, Mattsing G, et al. (2018) Brown bear (*Ursus arctos*) attacks resulting in human casualties in Scandinavia 1977–2016; management implications and recommendations. PLoS ONE 13(5)

Stone SA (2016) Livestock and Wolves: A Guide to Nonlethal Tools and Methods to Reduce Conflicts. Second Edition. Defenders of Wildlife, Washington, DC

Stork NE, Samways MJ (1995) Inventorying and Monitoring. In: Heywood VH (ed) Global Biodiversity Assessment. United Nations Environment Programme. Cambridge University Press

Takahata C, Nielsen SE, Takii A, Izumiyama S (2014) Habitat Selection of a Large Carnivore along Human-Wildlife Boundaries in a Highly Modified Landscape. PLoS ONE 9(1): e86181

Taubman W (2003) Khrushchev: The Man and His Era. Free press, Sydney

Taylor W, Shnaider S, Abdykanova A, Fages A, Welker F, Irmer F, et al. (2018) Early pastoral economies along the Ancient Silk Road: Biomolecular evidence from the Alay Valley, Kyrgyzstan. PLoS ONE 13(10)

Tereshchenko VV (2015) Krasnoznamennyi Vostochnyi pogranichnyi okrug: istoriya sozdaniya i razvitiya (Red Banner Eastern Border District: History of creation and development). Moscow

Thirgood S, Woodroffe R, Rabinowitz A (2005) The impact of human–wildlife conflict on human lives and livelihoods. In: Woodroffe R, Thirgood S, Rabinowitz A (eds) People and wildlife: conflict or coexistence? Cambridge University Press, Cambridge, pp 13–26

Thomassen J, Linnell J, Skogen K (2011) Wildlife-Human Interactions: From Conflict to Coexistence in Sustainable Landscapes. Final report from a joint Indo-Norwegian project 2007-2011. Norwegian Institute for Nature Research, NINA Report 736

Thorpe A, Anrooy R, Niyazov BN, Sarieva MK, Valbo-Jørgensen J, Millar AM (2009) The collapse of the fisheries sector in Kyrgyzstan: An analysis of its roots and its prospects for revival. Communist and Post-Communist Studies, 42(1):141–163

Tokmergenov TZ (2006) Asiatic Wild Dog Cuon alpinus Pallas, 1811. In: Davletkeldiev AA, Shukurov ED, Chyngozhoev AT, Burkhanov AM, Mamatov SM (eds) Krasnaya kniga Kyrgyzskoi Respubliki (Red Book of Kyrgyz Republic). State Agency on Environmental Protection and Forestry under the Government of Kyrgyz Republic. Institute for Biology and Pedology, National Academy of Sciences of Kyrgyz Republic, Ecological Movement “Aleine” of Kyrgyzstan. Second edition, Bishkek, 544 p. – Text in Kyr., Rus., Eng. languages

Toktomushev K (1982) Grazhdanskaya voina (Civil war). In: Oruzbaeva BO (ed) Kirgizskaya Sovetskaya Sotsialisticheskaya Respublika. Entsiklopediya. Akademiya Nauk Kirgizskoi SSR, Gosudarstvennyi Komitet Kirgizskoi SSR po delam izdatelstv, poligrafii i knizhnoi torgovli. (Kyrgyz Soviet Socialist Republic. Encyclopaedia. Academy of Sciences of the Kyrgyz SSR, State Committee of the Kyrgyz SSR for Publishing, Printing and Book Trade). Glavnaya Redaktsiya Kirgizskoi Sovetskoi Entsiklopedii, Frunze, pp 138–141

Toropova VI (2006) Snow leopard Uncia uncia Shreber, 1775. In: Davletkeldiev AA, Shukurov ED, Chyngozhoev AT, Burkhanov AM, Mamatov SM (eds) Krasnaya kniga Kyrgyzskoi Respubliki (Red Book of Kyrgyz Republic). State Agency on Environmental Protection and Forestry under the Government of Kyrgyz Republic. Institute for Biology and Pedology, National Academy of Sciences of Kyrgyz Republic, Ecological Movement “Aleine” of Kyrgyzstan. Second edition, Bishkek, 544 p. – Text in Kyr., Rus., Eng. Languages

Treves A (2009) Hunting for large carnivore conservation. Journal of Applied Ecology 46:1350–1356

Treves A, Naughton-Treves L, Harper E, Mladenoff D, Rose R, Sickley T, Wydeven A (2004) Predicting Human-Carnivore Conflict: A Spatial Model Derived from 25 Years of Data on Wolf Predation on Livestock. Conservation Biology, 18(1):114–125

Trofimuk AA (2002) Izbrannye trudy. Strategiya i metodika poiskov i razvedki mestorozhdenii nefti i gaza (Selected Works. Strategy and methodology for prospecting and exploration of oil and gas fields). Volume 2. Izdatelstvo SORAN Geo, Novosibirsk

Troyanovsky O (2000) The Making of Soviet Foreign Policy. In: Taubman W, Khrushchev S, Gleason A (eds) Nikita Khrushchev. Yale University Press, New Haven and London

Tsytsulina K (2008) Ellobius alaicus. The IUCN Red List of Threatened Species 2008:e.T7653A12840168

Tursunov ST (1980) Razvitie tonkorunnogo obtsevodstva v Kirgizskoi SSR (Development of fine-wool sheep breeding in the Kyrgyz SSR). Ministry of Agriculture of the Kyrgyz SSR, Frunze

Umurzakov S (1982) Fiziko-geograficheskoe rayonirovanie. In: Oruzbaeva BO (ed) Kirgizskaya Sovetskaya Sotsialisticheskaya Respublika. Entsiklopediya. Akademiya Nauk Kirgizskoi SSR, Gosudarstvennyi Komitet Kirgizskoi SSR po delam izdatelstv, poligrafii i knizhnoi torgovli. (Kyrgyz Soviet Socialist Republic. Encyclopaedia. Academy of Sciences of the Kyrgyz SSR, State Committee of the Kyrgyz SSR for Publishing, Printing and Book Trade). Glavnaya Redaktsiya Kirgizskoi Sovetskoi Entsiklopedii, Frunze, pp 84–95

Undeland A (2005) Kyrgyz Livestock Study. Pasture management and use. Washington, DC: The World Bank

UNDP-GEF The United Nations Development Programme, The Global Environment Facility (2016) Paxton M, Scott T, Watanabe Y (eds) Silent Roar: UNDP and GEF in the Snow Leopard Landscape. Published by UNDP-GEF

UNEP World Conservation Monitoring Centre (2002) Mountain Watch: environmental change and sustainable development in mountains. UNEP-WCMC

UNEP-GEF United Nations Environment Programme and Global Environment Facility (2009) Grant Request for Sustainable Land Management in the High Pamir and Pamir-Alai Mountains – an Integrated and Trans-boundary Initiative in Central Asia. UNEP, Nairobi

UNEP-WCMC and IUCN (2016) Protected Planet Report 2016. UNEP-WCMC and IUCN: Cambridge UK and Gland, Switzerland

United Nations (2016) United Nations Conference on the Environment, 5-16 June 1972, Stockholm. https://www.un.org/en/conferences/environment/stockholm1972. Accessed on 15.05.2017

Usenbaev K (1982) Vosstanie 1916 g. (Riot of 1916). In: Oruzbaeva BO (ed) Kirgizskaya Sovetskaya Sotsialisticheskaya Respublika. Entsiklopediya. Akademiya Nauk Kirgizskoi SSR, Gosudarstvennyi Komitet Kirgizskoi SSR po delam izdatelstv, poligrafii i knizhnoi torgovli. (Kyrgyz Soviet Socialist Republic. Encyclopaedia. Academy of Sciences of the Kyrgyz SSR, State Committee of the Kyrgyz SSR for Publishing, Printing and Book Trade). Glavnaya Redaktsiya Kirgizskoi Sovetskoi Entsiklopedii, Frunze, pp 130–131

Usenova R (2009) S. I Ilyasov o pervykh kooperativnykh khozyaistvakh Kyrgyzstana (S. I. Ilyasov about the first cooperative farms of Kyrgyzstan. Otan Tarikhy No.2. http://www.iie.kz/?p=1554&lang=ru accessed on 18.09.2015

Vaccaro I, Beltran O, Paquet PA (2013) Political ecology and conservation policies: some theoretical genealogies. Journal of Political Ecology 20(1), pp 255–272

Vaisman A, Mundy-Taylor V, Kecse-Nagy K (2013) Wildlife trade in the Eurasian Customs Union and in selected Central Asian countries. Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Geneva, Switzerland

Vandergeest P, Peluso NL (2015) Political forests. In: Bryant RL (ed) The International Handbook on Political Ecology. Cheltenham, Edward Elgar, pp 162–175

Vasilev L S (1998) Istoriya Vostoka (History of East). 1 tom, Vysshaya Shkola, Moscow

Verband für das Deutsche Hundewesen (2014) Standart des Taigans Nr. 994-DE 29.10.2014. https://www.vdh.de/home/

Vercauteren KC, Dolbeer RA, Gese EM (2010) Identification and Management of Wildlife Damage. USDA National Wildlife Research Center-Staff Publications

Visser O, Spoor M (2011) Land grabbing in post-Soviet Eurasia: the world's largest agricultural land reserves at stake, The Journal of Peasant Studies, 38(2):299–323

Volynets A (2019) Sekrety vneshnei togovli SSSR v gody Velikoi Otechestvennoi voiny (Secrets of foreign trade of the USSR during the Great Patriotic War)at https://profile.ru/history/sekrety-vneshnej-torgovli-sssr-v-gody-velikoj-otechestvennoj-vojny-141737/ accessed on 15.07.2019

Vyrypaev VA (1979) Ekologicheskie predposylki sokhraneniya khischnykh mlekopitaiuschikh v gornykh biotsenozakh Issyk-Kulskoi oblasti (Ecological prerequisites for the preservation of predatory mammals in mountain biocenoses of the Issyk-Kul oblast). Ekologicheskie osnovy okhrany i ratsionalnoe ispolzovanie khischnykh mlekopitaiuschikh (Ecological bases for protection and rational use of predatory mammals). Nauka, Moskow

Vyrypaev VA (1985) Kirgizia. In: Bibikov DI (ed) Volk. Proiskhozhdenie, sistematika, morfologiya, ekologiya (The Wolf. History, Systematics, Morphology, Ecology). Izdatelsvto Nauka, Moscow

Vyrypaev VA, Vorobyov GG (1983) Volk v Kirgizii: Ekologo-geograficheskу ocherk (Wolf in Kyrgyziya. Ecological – geographical essay). Akademiya Nauk Kirgizskoi SSR (Academy of Science of Kyrgyz SSR). Ilim, Frunze

Wagner P, Tiutenko A, Mazepa G, Borkin LJ, Simonov E (2016) Alai! Alai! – a new species of the Gloydius halys (Pallas, 1776) complex (Viperidae, Crotalinae), including a brief review of the complex, Amphibia-Reptilia, 37(1), pp 15–31

Wang SW, Macdonald DW (2006) Livestock predation by carnivores in Jigme Singye Wangchuck National Park, Bhutan. Biological Conservation 129:558–565

Watanabe T (2016) Why Do We Need to Make Efforts to Map the Transition?. In: Kreutzmann H, Watanabe T (eds) Mapping Transition in the Pamirs. Advances in Asian Human-Environmental Research. Springer, Cham

Watanabe T, Anarbaev M, Izumiyama S (2010) Wolf depredation on livestock in the Pamir. Geographical Studies, No. 85

Watanabe T, Anarbaev M, Liu Y, Sawagaki T, Izumiyama S Miyahara I, Komatsu T (2013) Place Names as an Ecotourism Resource for the Alai Valley of the Kyrgyz Pamir. Geographical Studies, Volume 88, No. 2

Watanabe T, Shirasaka S (2016) Kezüü and Novad: A Form of Pastoralism in the Eastern Alai Valley, Southern Kyrgyzstan. In: Kreutzmann H, Watanabe T (eds) Mapping Transition in the Pamirs. Advances in Asian Human-Environmental Research. Springer, Cham

Weber K T, Horst Sh (2011) Desertification and livestock grazing: The roles of sedentarization, mobility and rest. Pastoralism: Research, Policy and Practice, 1(19)

Weinberg PI, Fedosenko AK, Arabuli AB, Myslenkov A, et al. (1997) The Commonwealth of Independent State (Former USSR) In: Shackleton DM (ed) and the IUCN/SSC Caprinae Specialist Group. Wild Sheep and Goats and their Relatives. Status Survey and Conservation Action Plan for Caprinae. IUCN, Gland, Switzerland and Cambridge

Western D, Waithaka J (2005) Policies for reducing human-wildlife conflict: a Kenya case study. In: Woodroffe R, Thirgood S, Rabinowitz A (eds) People and wildlife: conflict or coexistence? Cambridge University Press, Cambridge, pp 357–372

White RM, Fischer A, Marshall K, Travis J, Thomas J et al. (2009) Developing an integrated conceptual framework to understand biodiversity conflicts. Land Use Policy, Volume 26, Issue 2, pp 242–253

Wieckowski M (2013) Eco-frontier in the mountainous borderlands of Central Europe.The case of Polish border parks. Revue De Geographie Alpine - Journal of Alpine Research, 101-2

Wiersema G (1983) Project Ibex: Ibex Habitat Inventory and Mapping in the European Alps. Mountain Research and Development, Volume 3, No. 3, pp 303–305

Wilbanks CA (1995) Alternative methods of predator control. Symposium Proceedings - Coyotes in the Southwest: A Compendium of Our Knowledge

Wilson R T (1997) Livestock, pastures, and the environment in the Kyrgyz Republic, Central Asia. Mountain Research and Development 17(1):57–68

Winson EO (1988) Editor's foreword. In: Wilson EO (ed) Biodiversity. The National Academies Press, Washington, DC

Woodroffe R, Frank LG, Lindsey PA et al. (2007) Livestock husbandry as a tool for carnivore conservation in Africa's community rangelands: a case-control study. Biodivers Conserv 16, 1245–1260

Woodroffe R, Thirgood S, Rabinowitz A (2005) The impact of human–wildlife conflict on natural systems. In: Woodroffe R, Thirgood S, Rabinowitz A (eds) People and wildlife: conflict or coexistence? Cambridge University Press, Cambridge, pp 1–12

World Bank (2016) Migration and Remittances Factbook 2016. Third edition. Washington, DC: World Bank

Wunner WH (2007) Rabies Virus. In: Jackson AC, Wunner WH (eds) Rabies (second edition). Elsevier

WWF World Wide Fund For Nature (2018) Living Planet Report: Aiming Higher. Grooten M, Almond REA (eds) WWF, Gland, Switzerland

Xinhua News Agency (2018) China natural gas imports surge in 2017. http://www.xinhuanet.com/english/2018-01/12/c_136890961.htm accessed on 11.03.2018

Yanushevich AI, Aizin BM, Kydyraliev AK, Umrikhina GS et al. (1972) Mlekopitayushchie Kirgizii (Mammals of Kyrgyziya). Ilim, Frunze

Yudin PF (1956) From the Journal of Ambassador P. F. Yudin, Record of Conversation with Mao Zedong, 31 March 1956. April 05, 1956, No. 289. History and Public Policy Program Digital Archive, Archive of Foreign Policy, Russian Federation (AVPRF), fond 0100, opis 49, papka 410, delo 9, listy 87-98

Zhirnov E (2012) Prizivaiut ne podchinyatsya prikazam "gryaznoi baby". Kommersant Vlast, No. 22 04.06.2012, page 56

Zhunushov AT (2011) Beshenstvo (Rabies). Ministerstvo selskogo khozyaistva Kyrgyzskoi Respubliki (Ministry of agriculture of the Kyrgyz Republic), Bishkek

Zima A G (1959) Kirgiziya nakanune velikoi Oktyabrskoi Sotsialisticheskoi Revoliutsii (Kyrgyziya before the Great October Socialist Revolution. Akademiya Nauk Kirgizskoi SSR (Academy of Science of Kyrgyz SSR). Frunze

Zimmerer KS, Bassett TJ (2003). Political ecology: an integrative approach to geography and environment-development studies. New York, Guilford press

Zisenis M, Richard D, Price M, Torre-Marin A et al. (2010) 10 messages for 2010 Mountain ecosystems. European Environment Agency, Copenhagen

Zubkova E (2000) The Rivalry and Rehabilitation. In: Taubman W, Khrushchev S, Gleason A (eds) Nikita Khrushchev. Yale University Press, New Haven and London

Zverev MD (1980) Senzhnyi bars (Snow leopard). Izdatelstvo Kainar. Alma-Ata

Zvezhinsky SS, Ivanov VA, Sizov SM, Trushin AA (2007) Okhrana sukhoputnykh granits SSSR vo vtoroi polovine XX veka. Analitechsky obzor po materialam otkrytoi pechati (Protection of the land borders of the USSR in the second half of the twentieth century. Analytical review on materials of open press)

Transliteration and spelling

In the thesis the Library of Congress system of transliteration was used with some adaptations. For Russian language materials and terms, the use of the soft sign is omitted in words such as *oblast, volost, bolshoi* etc. The same guideline is used for the transliteration of Kyrgyz words, however with the use of the extra two umlauted letters *ö* and *ü* of the German alphabet, which express much more accurate pronunciation and transliteration. Long vowels are represented by double vowels, for example *Alaikuu*, *suu*, *too* etc. Some terms and geographic names in topographic maps still hyphenate according to the current Kyrgyz language standards and in the thesis, they were written with a dash such as *bai-manap*, *Chong-Alai, Sary-Bagysh,* etc. The spelling of terms and words is retained in their literature form of both languages. For instance, Kyr. *aksakal* instead of *aqsaqal,* and Rus. *koshara* instead of *kashara.* In addition, in Kyrgyz language, the *j* in John, is harder sound than in Russian, nevertheless it is transliterated as *zh* instead of *j*, such as *zhailoo*, *Andizhan*, *zhoru,* etc.

The official name of the country is used in the form of "the Kyrgyz Republic". During the Soviet times it was called the Kyrgyz SSR, Kirgizia, as well as Kyrgyzstan. Within the thesis, the official names of ministries, state agencies or international treaties appear as in the respective documents. While in general aspects, the common version of name is used.

Figures

Tables

Boxes