

THE CHALLENGES OF
NATURE CONSERVATION
IN THE TAJIK NATIONAL PARK -
OBJECTIVES VERSUS REALITIES

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Abstract

Natural resources form the base of the main economic activities of livestock breeding and agriculture in the Tajik Pamirs. In order to protect the many species that make up the diverse flora and fauna within this isolated high mountain region, certain areas have been segregated from economic use and were strictly protected within *zapovedniky* and *zakazniky* during the Soviet period of the history of Tajikistan. After the breakdown of the USSR, subsidies from the lowlands were no longer available and the economic situation in the country's high mountain region worsened. Together with a high population growth this put increased pressure on the already limited natural resources. The resources could not be adequately conserved within the existing network of protected areas. **Part I** of this thesis gives an **Introduction** to the difficult situation of nature conservation in the Pamirs and briefly describes the project to create a national park. Unlike in the past, this protected area should combine nature protection activities with regional economic development and thus contribute to an improvement of the difficult economic situation in the Pamirs. Activities to instigate the Tajik National Park (TNP) started more than 10 years ago but due to the civil war and the fact that the state does not consider ecological projects a priority, the park has not yet been realised.

This situation offers the exciting possibility to analyse the proposed activities in nature conservation within the TNP, to compare the park with international concepts of protected areas and to propose possible ideas for its further implementation. For this reason, the objectives of the people concerned in this project were investigated and compared with the present situation of resource use and management within the park area.

In **Part II** the **Concepts and Methodology** behind this thesis are outlined. The concept of sustainability served as the basis for the discussion of theories about resource use and nature conservation. Concepts of conservation are divided in strategies separating or integrating nature conservation into the whole landscape. Furthermore, approaches toward combining nature conservation with the human dimension of resource use are outlined.

Data generation and analysis has been done according to qualitative methods. The empirical basis of this thesis is built on numerous guided interviews and discussions within and outside three selected study areas in the proposed area of the TNP. Further data were collected by the mapping of resource use and participatory observation and desktop studies.

The **Results** of the study are given in **Part III**. First, an overview about the Tajik history in nature conservation is given. During the Soviet era, nature conservation was theoretically geared to the economy. However, its integration with a 'rational use of resources' could not be implemented. Nature conservation thus focused on the protection of single species within separated areas that were not accessible to society at large. This led to the misconception of protected areas just being 'islands' for researchers and also fostered the idea that nature conservation is not at all compatible with nature use.

The area of the TNP includes various landscape ecosystems but mainly covers high mountain barren land and grassland. Seven main actor categories have been identified within the scope of the TNP: the local resource users, the regional and local administration, the TNP authority, the national and foreign scientists, the NGOs, tour operators and tourists.

The target state of the TNP is composed of the official goals of the park and the objectives as assessed by the various actor categories. According to the park authorities, the official goals of the TNP focus on nature conservation, the promotion

of economic development and the increase of research activities. Actors from the regional level and tour operators expect great economic input for the whole region once the TNP is established. Local actor categories hardly mentioned concrete objectives concerning the TNP but stated their needs in a more general manner. Their interests focus on new opportunities for income generation outside the farming sector and on improved access to and supply with natural resources.

The analysis of the actual state of the use and management of natural resources and nature conservation within the TNP points out that despite its remoteness, the area is spatially and temporarily intensively used. Due to low mobility not all pastures are used and signs of overuse can be observed on easily accessible pastures. Wood and sub-shrubs are intensively used all year round as a source of energy. This affects almost all *teresken* areas in the eastern part and strictly protected forests in the western valleys. Wildlife resources, particularly Marco Polo sheep, are illegally hunted by members of various actor categories. The selling of hunting licences to foreign trophy hunters constitutes one of the few sources of income for nature conservation activities and the TNP. However, the money rarely reaches its proper destination and due to low salaries corruption is widespread at all levels. The management of the use of resources is not coordinated by the TNP, since it only exists as a paper park. In fact, resource use and resource management inside the TNP is the same as outside its area. Many local people are aware about the negative impact of their actions on the region's resources, however, they explained that due to the difficult economic situation they are not able to change the way they act. Illegal hunting of Marco Polo sheep has to be assessed as a strategy to save own livestock and as a reaction to the international hunting business from which only very few local people can benefit. Most people from the local level are not informed about the TNP and pay little attention to this project since they assess it to be of only very little importance for their livelihoods.

The **Synthesis and Conclusion** is outlined in **Part IV**. Firstly, the differences between the objectives of the TNP and its actual, present state are analysed. It is obvious that most of the objectives are not yet implemented. The appreciation of conservation varies much among the single actor categories. Many local actors do not integrate the use of resources with nature conservation. The TNP is mainly understood as being a project of strict nature conservation like those realised during the country's Soviet past and thus is likely to restrict their scope. Differences also occur in the management of resources and organisational aspects: zones that regulate the use of resources are not yet defined and mapped and the boundaries of the park itself are not clearly assessed in all areas; field staff of the TNP is missing and the TNP authority is not able to act as the coordinating agency for nature conservation activities; finally the goals of the park are often only described in a general manner but not given specific priorities.

Secondly, the TNP project is compared with another huge protected area in the region, namely the Biosphere Reserve Issyk Kul located in Kyrgyzstan. Even though the area of the TNP corresponds with the concept of a national park, its objectives are not fully compatible with this category but more closely oriented towards the concept of biosphere reserves. Biosphere reserves are considered valuable alternatives to national parks by the author. As a biosphere reserve, the protected area might have a better chance of realising a full integration of nature conservation and economic improvements within sustainable development.

Finally, requirements for the implementation of ecologically sustainable development within the TNP as assessed from the author's personal point of view are outlined. Furthermore, recommendations for different actor categories are given. Only with the combined efforts of all actor categories may the TNP be fully implemented and serve as a case study of how to integrate various interests into regional mountain development.

Zusammenfassung

Die vorliegende Arbeit, die sich mit dem Projekt des Tadjik National Park (TNP) - einem Großschutzgebiet im Tadschikischen Pamir - befasst, ist in vier Teile gegliedert. Im **ersten Teil** wird eine **Einführung** gegeben über die Problemstellung dieser Arbeit, werden die Zielsetzungen umschrieben und der Untersuchungsraum vorgestellt. Natürliche Ressourcen stellen seit jeher die Grundlage der Ökonomie im Pamir dar, die hauptsächlich auf der Viehwirtschaft und dem Ackerbau basiert. Bereits zu Sowjetzeiten wurden große Flächen als Schutzgebiete dieser Ressourcen ausgewiesen. Wegen ihrer strengen Schutzfunktion waren diese Gebiete aber nicht zugänglich für die lokale Bevölkerung und stellten somit Inseln mit einer speziellen Nutzung - der Nullnutzung - dar. Durch den Zusammenbruch der Sowjetunion, das damit verbundene Ausbleiben der Versorgungsleistungen und den Bürgerkrieg, verschärfte sich der Druck auf die lokalen Ressourcen rapide. Die bestehenden Schutzgebiete konnten diese Entwicklung nicht verhindern, sondern wurden selber Gegenstand übermässiger Nutzung. Das Projekt des TNP sollte neue Impulse im Naturschutz mit dringend benötigter ökonomischer Entwicklung kombinieren. Obschon dieses Projekt bereits seit mehr als 10 Jahren läuft, konnte es bis zum Zeitpunkt dieser Arbeit nur partiell umgesetzt werden.

Diese Situation bildete den Ausgangspunkt der vorliegenden Arbeit die das Projekt des TNP unter Berücksichtigung der verschiedenen Interessen der Beteiligten, respektive Betroffenen beleuchtet, Differenzen zwischen den Sichtweisen und Vorgehensweisen aufzeigt und das Projekt mit alternativen Schutzkonzepten vergleicht. Die Analyse setzt die offiziellen Zielsetzungen des TNP und die Bedürfnisse verschiedener Akteure (Soll-Zustand) der aktuellen Situation der Ressourcennutzung und des Naturschutzes im Park (Ist-Zustand) gegenüber, um daraus Hinweise für die zukünftige Umsetzung des Parks abzuleiten.

Der **zweite Teil** der Arbeit beschreibt die dieser Arbeit zugrunde liegenden **Konzepte und Methodologie**. Auf der Grundlage des Konzeptes der nachhaltigen Entwicklung werden verschiedene Theorien der Ressourcennutzung und des Naturschutzes diskutiert. Lösungsansätze werden vorgestellt, wie der Naturschutz mit der Ressourcennutzung kombiniert werden kann. Schließlich werden einige Kernelemente der Transformationstheorie dargestellt, die als entscheidend für eine Einschätzung der aktuellen Verhältnisse in Tadschikistan eingestuft werden.

Die Datenerhebung und die Datenauswertung orientierten sich an den Methoden der qualitativen Forschung. Die empirische Basis bilden Befragungen und Gespräche mit Personen aus verschiedenen Akteurkategorien, Kartierungen der Ressourcennutzung innerhalb des TNP, teilnehmende Beobachtungen und Literaturrecherche.

Der **dritte Teil** der Arbeit zeigt die **Resultate** der Analyse. Als erstes wird die Ausrichtung des Naturschutzes in Tadschikistan aufgezeigt. Während der Sowjetzeit wurde versucht, unter dem Konzept der 'rationalen Ressourcennutzung' den Naturschutz in die Ökonomie zu integrieren. Dies gelang aber kaum und so zielte der Naturschutz immer mehr auf den Schutz einzelner Arten innerhalb von strikten Schutzgebieten ab. Diese Trennung von Schutz und Nutzung ist bestimmend für die heutige Wahrnehmung und Akzeptanz von neuen Schutzgebieten.

Der TNP erstreckt sich über unterschiedliche Landschaftsökosysteme, umfasst aber hauptsächlich ödes Hochgebirgsland (Felsen und Gletscher) und Grasland. Sieben Akteurkategorien stehen mit dem TNP in mehr oder weniger direktem Kontakt: lokale Ressourcennutzer, lokale und regionale Behörden, die Direktion des TNP, nationale und ausländische Wissenschaftler, internationale Organisationen, Reiseveranstalter und Touristen.

Der Soll-Zustand des TNP zielt gemäß den Angaben der Park-Direktion auf drei Bereiche: Naturschutz, ökonomische Entwicklung und Forschung. Akteure der regionalen Ebene erwarten vom TNP eine unterstützende Wirkungen für die regionale Wirtschaft und ihre jeweiligen Institutionen oder Betriebe. Lokale Akteure hingegen richteten ihre Forderungen kaum direkt an die Adresse des TNP. Unabhängig vom TNP fordern sie verbesserte Möglichkeiten zur Einkommensgenerierung außerhalb der Landwirtschaft und freien Zugang zu und Versorgung mit natürlichen Ressourcen, insbesondere Energie-Ressourcen und Heu.

Die Analyse des Ist-Zustandes der Ressourcennutzung bzw. des Naturschutzes im TNP zeigt auf, dass das Gebiet trotz seiner Abgeschiedenheit lokal zeitlich stark genutzt wird. Eine reduzierte Mobilität der Viehzüchter führte in den letzten Jahren zu einem Ungleichgewicht der Weidenutzung und zu Erosionserscheinungen auf leicht zugänglichen Weiden. Wälder im Westen und Buschvegetation im Osten werden intensiv genutzt und dienen als Ersatz für die früher zur Verfügung gestellte Kohle. Wild, speziell die gefährdeten Marco Polo Schafe, wird von verschiedenen Akteurkategorien illegal gejagt. Der Verkauf von Jagdlizenzen an ausländische Trophäenjäger stellt eine der wenigen Einkommensquellen für den Naturschutz und somit den TNP dar. Wegen unübersichtlichen Verwaltungsstrukturen, tiefen Löhnen und Korruption erreichen diese Gelder aber nur selten ihren Bestimmungsort. Die Ressourcennutzung und der Naturschutz werden im TNP nicht speziell koordiniert, somit unterscheidet sich die Ressourcenhandhabung im Park nicht von jener außerhalb seiner Grenzen. Viele lokale Akteure sind sich des schädigenden Einflusses auf die Ressourcen bewusst, können aber ihren Angaben zufolge ihre kurzfristig ausgerichteten Überlebensstrategien angesichts der harten Bedingungen nicht ändern. Illegales Jagen ist einerseits eine Strategie, den knappen eigenen Viehbestand zu bewahren, andererseits stellt diese Handlung eine Reaktion dar auf die ungleichen Verhältnisse des Trophäenjagens, von dem nur einzelne lokale Akteure profitieren können. Die Mehrzahl der Bewohner im Gebiet des TNP ist kaum über dieses Projekt informiert. Ihr Interesse daran ist gering, da sie es als nicht relevant für ihren aktuellen Lebensunterhalt bewerten.

Die **Synthese und Schlussfolgerung** wird im **vierten Teil** dargestellt. In einem ersten Schritt werden der Soll- und der Ist-Zustand des TNP miteinander verglichen. Dabei wird klar, dass kaum eine der Zielsetzungen des TNP verwirklicht ist. Die Wahrnehmung des Naturschutzes ist sehr unterschiedlich. Viele lokale Akteure sind es nicht gewohnt, dass Naturschutz auf einer Fläche mit deren Nutzung kombiniert werden kann und verstehen deshalb den TNP als ein weiteres staatliches Schutzprojekt, welches ihren Handlungsspielraum weiter einschränken wird. Unterschiede bestehen auch im Management der Ressourcen und in organisatorischen Belangen: die Parkgrenzen sind noch nicht überall klar festgelegt, die Nutzungszonen weder bestimmt noch umgesetzt; der TNP hat keine Angestellten außerhalb des Management Centers; die Parkbehörde wird ihrer Funktion als koordinierende Instanz im Naturschutz nicht gerecht; und schließlich sind die Ziele des Parks nur sehr generell umschrieben und in ihrer Wichtigkeit nicht gewichtet.

Um Inputs für die weitere Umsetzung des TNP zu gewinnen, wird das Projekt mit einem ähnlich großen Schutzgebiet in Zentralasien, dem Biosphärenreservat Issyk Kul in Kirgistan, verglichen. Dabei wird ersichtlich, dass die Fläche und das Gebiet des TNP zwar dem Nationalpark-Konzept entspricht, seine Zielsetzungen aber eher auf das Konzept der Biosphärenreservate ausgerichtet sind. Letzteres kombiniert Aktivitäten des Naturschutzes mit ökonomischen Entwicklungen und wird von der Autorin als sinnvolle Alternative zum TNP-Konzept gewertet.

Im letzten Kapitel werden aus der Sicht der Autorin Bedürfnisse aufgeführt, wie vom Ist-Zustand der Soll-Zustand des TNP erreicht werden kann, respektive Ideen gegeben, inwiefern die Zielsetzungen des Soll-Zustandes unter Beteiligung aller Betroffenen überarbeitet werden sollten.

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Glossary

- Actor category** Actors are individuals that interact with the environment. They may be integrated in different categories whose composition varies according to the criterias of selection (age, sex, livelihood, culture, activity, location, etc.). Within this thesis actor categories have been defined according to the resource use, the administrative level and the activity within the TNP. The seven actor categories were then divided into several subcategories (see chapter 5). Small actor categories with only few members may be referred to as actor groups when its members have a feeling of membership and thus act as a group (e.g. the TNP authority). Unlike stakeholders, actors do not have to be interested in or affected by a certain project. The actor category 'tourists' for example is not really affected by the establishment of the TNP and is not interested in it, thus they may not be called 'stakeholders' (see below).
- Agroprom** Department for Agriculture (Russian).
- arkhar** Wild mountain sheep in general, in the Pamirs referring to the Marco Polo sheep (Russian).
- ayran** Yoghurt (Kyrgyz).
- Biosphere reserve** Established under UNESCO's Man and the Biosphere (MAB) Programme, biosphere reserves are a series of protected areas linked through a global network, intended to demonstrate the relationship between conservation and development (Heywood et al., 1995, p. 1105).
- Buffer zone** The region near the border of a protected area; a transition zone between areas managed for different objectives (see zones) (Heywood et al., 1995, p. 1106).
- Central Asia** Term used within this thesis for the region on the south-eastern border of the Soviet Union. It includes Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan.
- dara** Valley, pasture (Tajik).
- Demarcation** Demarcation is an operation that involves setting out the boundaries of a plot of land and physically determining them by means of boundary markers. 'Joint demarcation' is where all parties concerned are heard before settling a particular boundary (Leonard and Bottom, 2000).
- dzhilga** Valley, pasture (Kyrgyz).
- Ecosystem** A dynamic complex of plant, animal, fungal, and micro-organism communities and their associated non-living environment interacting as an ecological unit (Heywood et al., 1995, p. 1108).
- Eco-tourism** Travel undertaken to witness sites or regions of unique natural or ecological quality, or the provision of services to facilitate such travel (UNEP, 1995, p. 1108). However, this description does

not define the way of doing eco-tourism. A clear definition of this term is missing, therefore, eco-tourism does not particularly stand for ecological travelling. Within this thesis it is understood as a form of tourism that considers specific ecological and social features, such as ecological transport (trekking with pack-animals instead of helicopter), participation of actors from different levels in the tourism business, adequate wages, etc.

Ex situ conservation

Keeping components of biodiversity alive away from their original habitat or natural environment (Heywood et al., 1995, p. 1109), meaning outside protected areas.

Flagship species

Popular, charismatic species that serve as symbols and rallying points to stimulate conservation awareness and action (Heywood et al., 1995, p. 1109). Different actor categories, such as the TNP authority as well as employees of NGOs assess the Marco Polo sheep as flagship species for conservation in the Pamirs.

Gozkompriroda

State committee for hunting and protected areas (nature conservation) during Soviet era (Russian).

gozkhoz, -y

State farm(s) of the Republic of Tajikistan (Russian).

Habitat

The space used by an organism, together with the other organisms with which it coexists, and the landscape and climate elements that affect it; the place where an animal or a plant normally lives and reproduces (Heywood et al., 1995, p. 1110).

Hakim

Head of rayon (Kyrgyz).

Hot spot of biodiversity

Area with a high diversity of endemic species that are negatively affected by human impacts. Centres of mountain biodiversity are located in the tropical Andes, in the Caucasus and in the mountains of Central Asia where evolutionary developed diversity meets the maximum number of altitudinal belts.

hukumat

Administration of *rayon* (Kyrgyz).

In situ conservation

The conservation of biodiversity within the evolutionary dynamic ecosystems of the original habitat or natural environment (Heywood et al., 1995, p. 1111), particularly within protected areas.

Inventory, inventorying

The surveying, sorting, cataloguing, quantifying and mapping of entities such as genes, individuals, populations, species, habitats, ecosystems and landscapes or their components, and the synthesis of the resulting information for the analysis of process (Heywood et al., 1995, p. 1112).

jailoo

Summer pasture (Kyrgyz).

jemoat

Municipality (Russian).

kaymak

Cream (Kyrgyz).

kishlak

Settlement, small village (Russian).

kishtoo

Winter pasture, winter camp (Kyrgyz).

kolkhoz, -y

Collective farm(s) (Russian).

kurut

Dried yoghurt (Kyrgyz).

kuzdeu

Autumn pasture (Kyrgyz).

may

Butter (Kyrgyz).

Monitoring

The intermittent (regular or irregular) surveillance to ascertain the extent of compliance with a predetermined standard or degree

of deviation from an expected norm (Hellawell, 1991 in: Heywood et al., 1995, p. 1113).

National'nyi pamyatnik

Soviet category of protected areas, similar to a nature or national monument. Generally it comprises a limited area surrounding isolated natural features such as geological sites or exceptionally old trees (IUCN, 1992) (Russian).

Natural resources

Environmental science defines natural resources as the body of natural products, ecosystems and abiotic elements that constitute the Earth, as well as the various forms of natural energy (Parent, 1991 in: Leonard and Bottom, 2000). These can be subdivided into two distinct groups: non-renewable natural resources which comprise raw mineral materials: metals, metalloids, minerals with a wide variety of uses, fossil fuels, etc. and renewable natural resources which are continually renewed. The latter include water, cultivatable land and 'biological' resources, so-called because they are formed by living communities and exploited by human beings, such as forests, pastures, maritime fishing grounds, and biodiversity (Ramade, 1993 in Leonard and Bottom, 2000).

Nature Conservation

Conservation stands for the management of human use of organisms or ecosystems, including natural resources. Under the Soviet ruling nature conservation was understood in a strict (protective) manner that was not compatible with most forms of resource use. Western concepts of nature conservation however define conservation as sustainable use of resources that includes protection, maintenance, restoration, and enhancement of populations and ecosystems (according to IUCN et al., 1991). UNEP adds to this definition that the judicious use of natural resources has to be beneficial for the human society and that conservation is important also for ethical reasons (Heywood et al., 1995, p. 1107).

nauka

Science, with overtone of a sacred calling (Weiner, 1999) (Russian).

oblast

Province (Russian).

Potential of nature

Totality of those components of nature that are assessed as valuable and useful by a certain society to a specific date (Wiesmann, 1995, p. 11). It forms the dimension of valuation of the ecological sustainability as assessed by Wiesmann (1995). Within the common speech this term is often referred to as natural resources or just resources.

Prirodnyj Nacional'nyj park

Soviet category of protected areas, equivalent to the category II of IUCN (national park). These protected areas were mainly implemented for the protection of outstanding nature for scientific, educational and recreational purposes (Meessen, 1992; Hurni et al., 2002a). They included wilderness areas as well as arable land (mostly state forests). *Nacional'nyj parky* were zoned into areas in which economic activities were controlled, nature reserves where economic activities and public entry was forbidden, nature sanctuaries where tourists were allowed but economic activities were strictly prohibited, peripheral buffer areas of economic activity where habitation and sustainable levels of exploitation of

natural resources were permitted (IUCN, 1992) (Russian).

Protected area	Protected areas preserve landscapes, seascapes and natural areas for appropriate, long term, appreciation and use by human beings and are a vital contribution to the conservation of the world's natural and cultural resources. Their values range from the protection of natural habitats and associated flora and fauna, to the maintenance of environmental stability of surrounding regions (CBD and UNEP, 2003b). IUCN lists six categories of protection in descending order of importance (see appendix). They all focus on different management priorities which include scientific research, wilderness protection, preservation of species and genetic diversity, maintenance of environmental services, protection of specific natural and cultural features, tourism and recreation, education, sustainable use of resources from natural ecosystems, maintenance of cultural and traditional attributes (Leonard and Bottom, 2000). Protected areas can provide opportunities for rural development and rational use of marginal lands, generating income and creating jobs, for research and monitoring, for conservation education, and for recreation and tourism (CBD and UNEP, 2003b).
<i>rayon</i>	District (Russian).
<i>sarmay</i>	Thickened butter (yellow butter) (Kyrgyz).
Sedentarisation	Process by which nomadic or transhumant pastoralists become settled. This process was implemented in the Eastern Pamirs in the beginning of the Soviet governance in the 1920s. While the intention of the governments is said to be to provide improved services to the population, the strategies are often founded on the belief that pastoralists are unable to manage land effectively, and that the mobility of their way of life is evidence of a disorganised system. Several studies have demonstrated, however, that dry rangelands are ideally suited to mobile livestock keeping (Leonard and Bottom, 2000).
<i>shivaq</i>	Sub-shrub (<i>Artemisia</i> species), mainly growing in the Western Pamirs (Kyrgyz).
<i>sovkhoz, -y</i>	State farm(s) during Soviet time (Russian).
Stakeholder	A stakeholder is an individual person, group or institution with an interest in, or influence over, the success or failure of a project, programme or policy. Besides interested parties this term also includes affected parties. This definition of stakeholders includes both winners and losers, and those involved or excluded from decision-making processes. Stakeholders may be classified in primary and secondary stakeholders. Primary stakeholders are those ultimately affected by a project, either positively or negatively. With respect to the TNP, the local resource users as well as some tour operators have to be assessed as primary stakeholders. Secondary stakeholders are the intermediaries in the aid delivery process, in this case the NGOs and international organisations as well as the scientists. Key stakeholders are those who can significantly influence, or are important to the success of the project. Concerning the TNP these are the administration and the TNP authority. The range of stakeholders and the roles they play is not static. Neither should it be assumed that all actors within one category are homogenous in their perceptions. Such perceptions depend

	on many factors which need to be explored through the analysis (Mayers, 2001).
Subsidies	Government grants to suppliers of goods or services (Heywood et al., 1995, p. 1117).
<i>Tadjikles</i>	State forestry enterprise which controls most of the conservation organisations in Tajikistan (Russian).
<i>teresken</i>	Sub-shrub (<i>Ceratoides papposa</i>), mainly growing in the Eastern Pamirs (Russian).
Threatened species	Species that are, often genetically impoverished, of low fecundity, dependent on patchy or unpredictable resources, extremely variable in population density, persecuted or otherwise prone to extinction in human-dominated landscapes (Heywood et al., 1995, p. 1118).
<i>tizak</i>	Dung (Kyrgyz).
<i>tör</i>	Mountain pasture (Kyrgyz).
<i>ular</i>	<i>Tetraogallus tibetanus</i> , Tibetan snow cock. Local people use this term for various species of mountain wild cocks (Russian).
Ungulates	Hoofed wildlife. Within this paper this term mostly refers to the Siberian ibex (<i>Capra ibex siberia</i>) and the Marco Polo sheep (<i>Ovis ammon polii</i>).
<i>yurt</i>	Felt tent used on the summer pastures (Kyrgyz).
<i>Zakaznik</i>	Soviet category of protected areas that equivalent to a species management area, or national wildlife refuge, corresponding to the IUCN category IV. These protected areas always had a special intention, e.g. protection of a certain fauna or flora species (Meessen, 1992). They were often established for a period of five or ten years to enable certain flora and fauna populations to recover. <i>Zakazniky</i> were often only fully protected in certain seasons, while controlled hunting was sometimes allowed. The status and administration of these protected areas strongly varied in the different republics of the Soviet Union (IUCN, 1992). The TNP encloses the <i>zakazniky</i> Muzkolski and Sangvorski (Russian).
<i>Zapovednik</i>	Soviet category of protected areas, corresponding to a strict nature reserve and equivalent to category I of IUCN. The aim of these protected areas was to protect nature and natural processes without any intrusion from outside (Meessen, 1992; Hurni et al., 2002a). The inviolable nature within this territory was dedicated to long-term scientific, especially ecological, study during Soviet era (Weiner, 1999) and therefore included typical or unique plots of natural land excluded from economic utilisation. Prohibited activities included building construction, any economic activities, such as agriculture or industry, and unrestricted entry. <i>Zapovedniky</i> were often surrounded by an area of semi-protected land which provided a buffer to the adjacent countryside (IUCN, 1992) (Russian).
<i>Zapovedno-okhotnich'ye khozyastvo</i>	Soviet category of protected area, similar to a national hunting reserve or a reserved hunting unit. These were highly protected areas that provided vital refuges for wildlife. However, the numbers of some game species were regulated by controlled hunting by state bodies (IUCN, 1992) (Russian).
Zone / zoning	According to Cornu (1994), a zone is a territorial area which is defined with a view to applying a specific set of regulations. The

term is commonly used in urban and regional development. A zoning order does not generally define the nature of the ownership or use rights to the area but lays down regulations about how the resources in question may be used (Leonard and Bottom, 2000).

Abbreviations

ACTED	Agence d' Aide à la Coopération Technique et au Développement (Agency For Technical Cooperation and Development), Paris
AKDN	Aga Khan Development Network, Geneva
AKF	Aga Khan Foundation, Geneva
BR	Biosphere Reserve
CAMP	Central Asian Mountain Partnership Programme, Bishkek
CBD	Convention on Biological Diversity, Québec
CDE	Centre for Development and Environment, University of Berne
CIS	Commonwealth of Independent States
CSD	United Nations Commission on Sustainable Development, New York
DTM	Digital Terrain Model
GBAO	<i>Gorno Badakhshanskaja Avtonomnaja Oblast</i> , (Autonomous Region Gorno Badakhshan)
GEF	Global Environmental Facility
GIS	Geographical Information Systems
GPS	Global Positioning System
GRIDA	Norwegian environmental information center supporting UNEP, Arendal, Norway
GTZ	German Society for Technical Cooperation, Berlin and Bonn
IIED	International Institute for Environment and Development, London
IP	Individual Project of the NCCR North-South
IUCN	World Conservation Union, Gland, Switzerland
IYM02	International Year of the Mountains 2002
MAB	UNESCO Man and the Biosphere Programme, Paris
MSDSP	Mountain Societies Development and Support Programme, Khorog
NABU	Naturschutzbund Deutschland (German Society for Nature Conservation), Bonn
NCCR North-South	Swiss National Centre of Competence in Research North-South, Berne
NDVI	Normalized Difference Vegetation Index
NGO	Non Governmental Organisation
PI	Pamir Initiative, Berne
PSP	Pamir Strategy Project, Berne
SDA	Sustainable Development Appraisal
SDC	Swiss Agency for Development and Cooperation, Berne
SLM	Sustainable Land Management
SSR	Socialist Soviet Republic
TNP	Tajik National Park
UNEP	United Nations Environmental Programme, Nairobi
UNESCO	UN Educational, Scientific and Cultural Organisation, Paris
UNU	United Nations University, Tokyo
USSR	Union of Soviet Socialist Republics
WRI	World Resource Institute, Washington
WWF	World Wide Fund for Nature, Gland, Switzerland

Preface

A wide range of studies is available on nature conservation activities. Intense scientific work has been carried out within the huge network of protected areas in the former Soviet Union. Most of this research though focused on disciplinary projects in natural sciences, while interdisciplinary methods and social sciences were often ignored. After the breakdown of the USSR, scientific work declined to a minimum, nature conservation had to deal with difficult conditions and new forms of resource use increased the pressure on landscape ecosystems inside and outside existing protected areas. Only now have new concepts of nature conservation and management of protected areas been developed, exchanged and applied to this area. Yet these concepts coming from the West have to be adapted to the specific situation and conditions within countries in political transition. Experience with these concepts is small in Tajikistan and many newly established protected areas, including the Tajik National Park, only exist as paper parks. Few scientific investigations have been carried out so far that analyse the relationship between nature conservation and the people concerned in protected areas.

This diploma thesis is part of the PSP (Pamir Strategy Project) and the NCCR North-South (National Centre of Competence in Research North-South) and focuses on the planned and required management of natural resources within the Tajik National Park and on a comparison of these objectives with the present situation of resource use. This comparison serves as a basis for assessing requirements for the further implementation of the Tajik National Park. The output of this thesis should provide the reader with an overview of nature conservation activities in the Tajik Republic in general, and in the TNP in particular. Furthermore the thesis suggests possible ideas for the future design of the park that takes into account the various interests of all people concerned.

My interest in mountain environments and nature conservation was instrumental to my studies in geography. In the beginning, my studies were strongly focused on physical geography. However, the social dimension - the interaction between environment and society - became more and more important to me. The Pamir Strategy Project gave me the perfect opportunity to at the same time satisfy my curiosity about high mountain areas and my interest in Soviet history and Central Asian cultures. After the field campaign conducted in 2001 and the process of data analysis, the desire arose to carry out my diploma work within this challenging field. Thanks to the NCCR North-South, particularly the Individual Project 'Natural Resources and Ecology' (IP2), this was able to be realised in 2002. Due to the integration of my diploma thesis into a research project I was able to further my knowledge in many respects, especially in field methods and interdisciplinary and intercultural teamwork. It was very interesting to follow and accompany the many phases of a specific research project to its completion and exchange the data collected from different analyses during my field work and at an international workshop with the people of the Pamirs. Furthermore, I learned much about data analysis, computer work and organisational matters.

Bern, April 2004
Andrea Haslinger

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Part I

Introduction

Chapter 1

Challenging conditions for nature conservation in the Pamir Mountains

Nature conservation faces challenging conditions in the Pamirs. The heritage of the Soviet ruling, particularly the network of protected areas, provided a base for certain aspects of nature conservation. This heritage was negatively affected by the collapse of the Soviet Union and the process of transformation. The establishment of the Tajik National Park demonstrates an example of the search of new approaches to nature conservation in Tajikistan.

1.1 The impact of the collapse of the Soviet Union

The Pamir Mountains, mainly located within Tajikistan, are a marginal area in terms of accessibility, peripheral location, distance to markets and surrounding international borders. They are also marginal with respect to economic development and social welfare. Options to increase the economic performance are strongly limited and mainly focus on the use of natural resources. Traditional patterns of land use, characterised by a coexistence of agriculture in valleys and mobile livestock breeding at higher altitudes, have proven sustainable over centuries and contribute to biodiversity and cultural heritage. These features are common to many mountain areas in the world. The transformation process following Tajikistan's independence after the breakdown of the Soviet Union in 1991 has meant, however, that the Pamirs face different challenges to those faced by mountain areas in the South: the transformation process entered all spheres of life and changed the mountain inhabitants' economic situation from one of relative prosperity to one involving a subsistence economy on a very low level. The decline of the economy, particularly the abandonment of the *sovkhozy* (the Soviet state farms) and the absence of support from outside the mountain area in the form of food, fodder, fuel and technology, forced people to revert to locally available natural resources. Due to lack of experience and knowledge in resource use as well as to harsh living conditions, the environment started to suffer from unadjusted land use in a way that was not present in this dimension during earlier times. As a consequence, the economic decline, coupled with a high population growth, led to intensified degradation of the limited natural resources, aggravating the ecological situation in the Pamirs.

The difficulties associated with meeting both the immediate needs of the growing population for food, energy, education, and health, and the requirements of long-term environmental sustainability are challenging conditions not only for those living in the Pamirs, but for Tajikistan as a whole. The major problem is thus to integrate environment and development in the actual decision-making process of the different

people involved (the so called actor categories). However, this is complicated by the fact that political preferences are often weighted towards overcoming short-term problems (Banskota, 1998).

1.2 The Tajik approach to nature conservation

Tajikistan chose an approach to conserving biodiversity and natural resources not by integrating environmental issues into economic development, but by increasing the area that is selected for protection against intensive use. The protected areas though have often only been concerned with the conservation of pristine landscapes and natural ecosystems; the way of life of people who live in these landscapes has often not been included considered (Poore, 1992). In 1992, Tajikistan declared parts of the fragile mountain area as Pamir National Park. This park remained a park merely on paper since in the same year civil unrests resulted in a civil war, causing all such projects to be put on hold until 1998.

As a consequence of the civil war, livestock decreased fast and the pressure on natural resources to cover the demand for meat increased. Certain wildlife species, particularly Marco Polo sheep, were intensively hunted for their meat. The introduction of food aid by international organisations and NGOs saved the mountain inhabitants from serious famine and reduced, together with a reorganisation of the structures in nature conservation, the pressure on the wildlife. However, the establishment of national and international hunting companies organising trophy hunting on Marco Polo sheep constituted a new threat to wildlife resources. Furthermore, this activity provoked negative reactions of the local population seeing one of their most valuable resources being sold to foreigners. Staff of nature conservation institutions were not able to enforce the legal regulations and thus were unable to control trophy hunting, to reduce poaching or to prevent forest resources from intense deforestation. Pastures were not managed by the staff of the protected areas, but by newly created farmer associations and other institutions who only regulated the use of the limited winter pastures. Due to increasing transportation costs, herders reduced their mobility and pastures directly around villages became seriously overused, showing degradation of vegetation and soil. As a consequence of the lack of control by park staff and the delegation of pasture management to other institutions, the so-called protected areas could not prevent or limit the destructive human impact on natural resources and thus were of little value.

In search of a valuable concept to reduce the increasing overuse of natural resources, to limit the environmentally damaging practices of land use and to reduce the poverty of the mountain inhabitants, the Tajik government readopted the Pamir National Park project. Representatives of the institutions dealing with the management of natural resources, the government and the Academy of Science worked out a proposal for a national park that focuses on both nature conservation and economic development of the Pamirs. The park design was based on three already existing protected mountain areas of Tajikistan. In 2001, the new project, now called Tajik National Park, was approved by the government.

1.3 The challenges of the Tajik National Park

Today about 5,300 people inhabit the park. They use the area as pasture, hunting ground, source of wood and base for agriculture. In addition, the area is temporarily used by numerous mobile pastoralists who spend the winter months along the borders or outside the park. The project of the Tajik National Park was developed, similarly to the former protected areas, without the participation of all stakeholders, particularly without the local people, i.e. those using the natural resources within

the park area. As a consequence, local people are not well informed about the project and have little interest in it per se since they perceive it as just another protected area established according to the Soviet concept, i.e. one strictly separating resource use from conservation. They are, however, very much concerned about how future park regulations may restrict their use of land and resources.

The project of the Tajik National Park still emerging. It is managed by a park authority which answers to the Ministry of Nature Protection. Together with scientists and employees of other state institutions, the park authority worked out the objectives of the Tajik National Park. They focus on three aspects:

- Protect the diverse ecosystems and their flora and fauna from further degradation.
- Foster the economic development in the Pamir Mountains by promoting tourism and a rational use of natural resources.
- Support research of mountain ecosystems.

An overall concept and management plan for the implementation of these objectives is missing. The national park constitutes a relatively new approach to nature conservation in Tajikistan. It was not a common idea in the Soviet system of protected areas. Only one national park was established before in Tajikistan in Shirkent valley (west of Dushanbe) and since it is dealing with similar challenges it cannot serve as a positive case study for the Tajik National Park. The authorities of the Tajik National Park are in search of an adapted concept of nature conservation that is accepted by the international community as only so is there any prospect of outside funding. They aim to promote a sustainable development of the Pamir region. However, this concept is virtually unknown in Central Asia. As such, sustainable development allows a wide degree of interpretation and implementation (Tabyshalieva, 1999). Due to the presence of sport hunting inside its area, the Tajik National Park is not compatible with international concepts of national parks, such as the category II of the IUCN classification scheme. Even though its goals are closer directed to the concept of 'biosphere reserves' according to the Man and Biosphere project (MAB), this idea is not exploited by the park authority and thus is not promoted.

As a consequence of a missing concept and management plan, the Tajik National Park is so far only a national decision without concrete implementation measures. Its area, which is still only roughly delimited, only increases the extent of the country's protected areas but as of yet contributes little to improving conservation.

The challenges of the Tajik National Park are manifold but similar to many other protected mountain areas of the world. They include the concept of the park, the management, coordination of activities within the park, funding, trained manpower, boundary and zones, law enforcement, involvement of stakeholders and balancing of conservation against other demands on natural resources (IUCN et al., 1991). Created with a top-down approach, the project is liable to fail unless the interests, perceptions and needs of the people concerned are fully taken into account (IUCN et al., 1991). The interests of the different stakeholders, however, do not only focus on the ecological sphere, but also include economic and social concerns. Therefore, the promotion of the Tajik National Park requires new and innovative approaches to conservation that have the potential to respond to the challenges of an environment influenced by economy and society. These approaches should integrate conservation of natural resources, cultural heritage and sustainable use of resources in mountain environments.

Since the problems in nature conservation are not unique to this area but common to the whole Tajik Pamirs, the park project is seen as a chance to constitute not only an example for new concepts of nature conservation in Tajikistan, but also

to contribute to a sustainable development of the whole Pamir region. However, this can only be realised when development becomes negotiable among different stakeholders (Wiesmann, 1995), leading to a flexible management of resources, bringing benefits to local communities and sustaining local livelihoods. To realise this, the former Soviet concepts of nature conservation, which argue that the use of resources has to be spatially separated from conservation, and the exclusion of social sciences from questions related to conservation have to be coped with. Furthermore, the challenges of conservation can only be overcome with an approach that integrates the interests of all people concerned.

From this it follows that without local ownership the Tajik National Park is doomed to fail. The most urgent step for the implementation of the park is to analyse the interests of the different actor categories concerned and firmly establish what each of them expect from the protected area. This needs to be done in order to formulate an ideal vision of what the national park should offer to man and environment and how it should be managed. Seeing as the Tajik National Park is not yet fully implemented this project offers an ideal opportunity to address the above-mentioned failures during the implementation phase.

This thesis assesses and analyses the challenges the Tajik National Park faces in trying to preserve fragile mountain biodiversity and natural resources whilst at the same time attempting to take into account the interests of all stakeholders. To this end, the 'target state' of the park (chapter 8) is compared with its actual state (chapter 9) with respect to the many different actor categories who interact with the natural environment in different manners (chapter 10). This comparison serves as a basis to appraise requirements for the park to contribute to an ecologically sustainable development (chapter 12). The analysis is geared toward the Sustainable Development Appraisal (SDA), a tool that supports processes of participatory planning and initiates the implementation of activities contributing to sustainable development (chapter 4).

Chapter 2

Research outline

2.1 The framework of the study

This thesis is linked to the Individual Project 'Natural Resources and Ecology' (IP2) within the National Centre of Competence in Research (NCCR) North-South. Together with other master thesis it is arranged within the scope of a PhD study focusing on knowledge generation for sustainable regional development in the High Pamir Mountains of Tajikistan. Since the starting position of this thesis goes back to another project, the following section gives a brief overview about the two projects under which umbrellas this work has been made possible. The methodology of these projects is outlined in chapter 5.

2.1.1 The Pamir Initiative (PI)

Mountain areas - the most marginal areas in many countries - have been strongly affected by the economic and social transformation processes following independence from the Soviet Union (Hurni and Jansky, 2001). The impact of the breakdown of the Soviet Union on the people living in the Pamirs, the associated abrupt cessation of subsidies in form of food, energy and infrastructure and the accentuation of an already difficult situation by the civil war all led to great poverty and a high dependence of these people on external support. Humanitarian aid, mainly from the Aga Khan Development Network (AKDN), saved the population from famine.

Humanitarian aid covers the most urgent needs in the short run but does not help to create a vision for the long term. The design of such a vision by different stakeholders and the elaboration of new strategies for the future development of this mountain region has been identified as an urgent need and a great challenge by the Swiss Agency for Development and Cooperation (SDC) and the Centre for Development and Environment (CDE) in 2001. Within the scope of the International Year of Mountains (IYM2002) they launched the Pamir Initiative (PI) that aims to support development efforts of local mountain residents and other stakeholders as well as to contribute to existing development programmes in the GBAO, namely to the GBAO administration, the Ministry of Nature Protection, the diverse programmes of the AKDN and the French NGO ACTED.

The Pamir Initiative is made up of two components:

The Pamir Strategy Project (PSP)

In cooperation with AKDN, ACTED and other international partners, as well as with local decision makers, this two-year project aimed to work out a strategy for sustainable mountain development of the Tajik Pamirs, both for natural biodiversity and human livelihoods (Breu and Hurni, 2003b).

To this end a knowledge system was generated which compiled information of 10 strategic sectors of the economic, social and ecologic spheres of the GBAO, directed to state, dynamics and trends. All this information, together with information from participatory studies at the village level, was to be combined in a Geographic Information System (GIS). For the GBAO, this information data base served as the basis for the development of a strategic vision, as worked out by different stakeholders in a so-called multi-level stakeholder workshop, held in Khorog in October 2002 (Breu and Hurni, 2003a). The single elements and steps of the PSP are shown in figure 2.1.

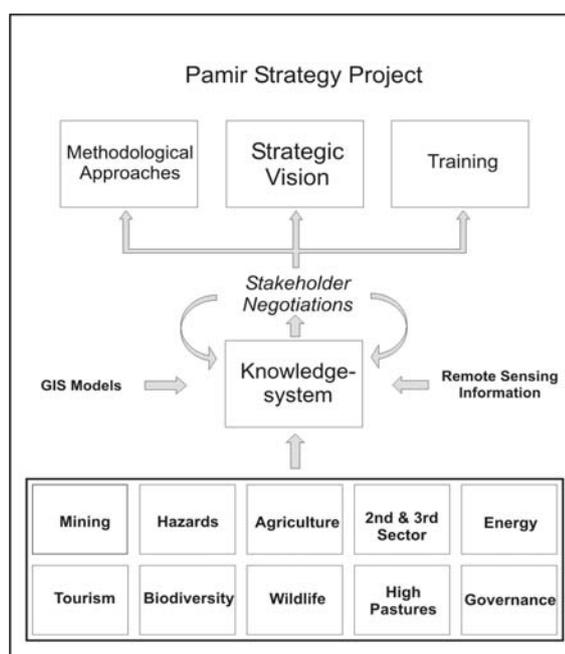


Figure 2.1: The set-up of the Pamir Strategy Project (PSP) (Breu and Hurni, 2003b, p. 7).

The compiled information and knowledge system should build the basis for decision-making and lead to cooperation among the different stakeholders. Furthermore, the geo-referenced database and information system of the region should serve as a tool for monitoring the impact of human activities in the Pamir region. However, the PSP did not only aim at getting concrete results, but also focused on providing conceptual and methodological approaches to sustainable development, that may also be applied to other mountain regions outside the Pamirs (Breu and Hurni, 2003b).

Even though the PSP constitutes a project in its own right that was finalised in autumn 2003, it also serves as preparation for a long term project that is included in the Pamir Initiative:

Sustainable Land Management in the High Pamir and Pamir-Alai Mountains - an Integrated and Transboundary Initiative in Central Asia

The preliminary studies carried out within the PSP and research of the UNU in the region showed that problems in land and water use, particularly the overexploitation and inappropriate land management, lead to increasing land degradation. These problems are characteristic for the whole region but are hardly addressed by the national agendas of Tajikistan or Kyrgyzstan. This led to the proposed project that aims at compensating these shortcomings by developing institutional capacities,

human resources and effective mechanisms for sustainable land management through integrated, participatory, and transborder resource management approaches (GEF, 2003, pp. 3–4).

The project worked out by the GEF will be executed by the UNU, the Tajik Ministry of Environment and Nature Protection, the Administration of the GBAO, the Kyrgyz Ministry of Ecology and Emergency Situations and the Kyrgyz Ministry of Labor and Social Protection. The Project Development Facility started in 2004 and the full project, with a duration of 8 years, is estimated to start in 2006 (GEF, 2003).

2.1.2 The National Centre of Competence in Research North-South (NCCR North-South)

The NCCR North-South¹ is one of 14 long-term research programmes implemented by the Swiss National Science Foundation (SNSF). The main goal of this programme that started in 2002, is to focus on ways of mitigating the syndromes of global change in urban, peri-urban, semi-arid and highland-lowland areas (NCCR, 2003). The mitigation of these syndromes can only be accomplished by combining national and international research that is promoted as disciplinary, interdisciplinary and transdisciplinary projects aiming to contribute to the understanding of syndromes of global change, their origin, and their effects on nature and man (Hurni, 2000).

The conceptual framework of the research of syndromes devised by the NCCR is briefly outlined in chapter 5.

Core problems frequently occurring in these syndrome contexts are addressed within eight Individual Projects (IP), each of them contributing to mitigation strategies at different levels of intervention (Hurni, 2000, p. 14). IP2 (Natural resources and ecology) mainly focuses on the enhancement of knowledge about sustainable land management with the aim of generating options to restore and maintain the various functions attributed to natural resources. It will contribute to minimising problems of land degradation, loss of biodiversity, and mismanagement of water. Beside the development of decision-support systems for land management and systems of impact monitoring, the development and adaptation of useful models to improve process-based understanding is promoted (Hurni, 2000, p. 46).

The following thesis really began with the field campaign carried out by the PSP in the summer of 2001. Together with Christina Boschi and Prof. Bernhard Nievergelt², a brief survey about the actual status of the fauna and human influence on the environment in the Eastern Pamirs was carried out (Boschi et al., 2002; Haslinger, 2002). The work was carried out as part of an international interdisciplinary study that focused on the socio-economic conditions (see Hangartner, 2002), livestock-breeding and high-pasture management (see Domeisen, 2002). The information collected during this field phase and afterwards during several workshops led to the formulation of the research proposal for this thesis.

2.2 Objectives of the study and research questions

2.2.1 Overall goal

The overall goal of this thesis is to assess the differences between the target state of the TNP and its actual state and to appraise requirements for the further realisation of the park contributing to a sustainable development. The target state is assessed as ideal vision of the park, taking into account the notions of the park authority

¹See also <http://www.nccr-north-south.unibe.ch/> for more information.

²Zoological Institute, University of Zurich, Switzerland.

as well as the demands of the various stakeholders being active on different levels. Parallel to the appraisal of requirements to realise the claim of the park, the target state is scrutinised according to the concept of sustainability (q.v. chapter 4). This may give inputs for a revision of the vision about the Tajik National Park (cf. figure 2.2).

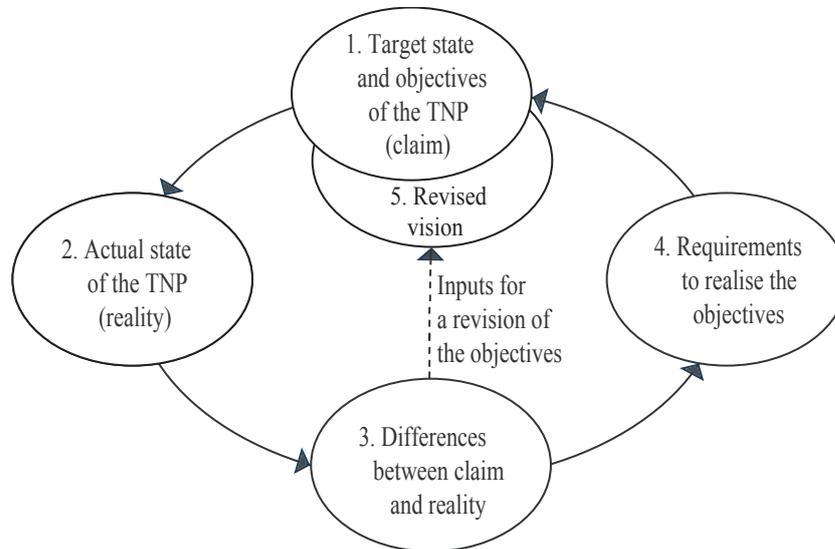


Figure 2.2: The composition of the thesis. The starting point of the thesis is the target state of the TNP. It includes the official aims as assessed by the park authority and the priorities as mentioned by the different actor categories and constitutes an ideal vision about the park. In a second step, the actual state of the TNP is assessed with respect to the use of resources. The third step includes the appraisal of the differences between claim and reality of the park. They serve as base for the discussion of requirements to realise the vision about the park. In addition, the differences give inputs for a possible revision of the primary vision (own illustration).

2.2.2 Objectives and research questions

Objectives

The focus of the thesis is directed upon the ecological sphere. This sphere is characterised by different interactions between various actor categories and landscape ecosystems which constitute the land-use system. Figure 2.3 illustrates the overall model of the land-use system within the Tajik National Park: The space is divided into different landscape ecosystems that overlap and interact together. The various actor categories belong to different intervention levels, reaching from the local to the international scale. They are embedded into the political and socio-economic framework and interact with each other in different ways. The interactions within the land-use system are roughly divided into two components: the consumptive use of resources and conservation.

The objective of this thesis is to present various ways of handling resources, to show different people's interests in and knowledge about conservation, how highly conservation is valid by different actor categories and how they perceive the treatment of natural resources. This analysis intends to present different perspectives on the same problem and thus serve as a base for further negotiations about the future management of resources within the Tajik National Park.

Particular attention is drawn to the perspectives of those actor categories not included in the planning process of the park, especially the local resource users. The perceptions of this actor category should be made accessible to those involved in

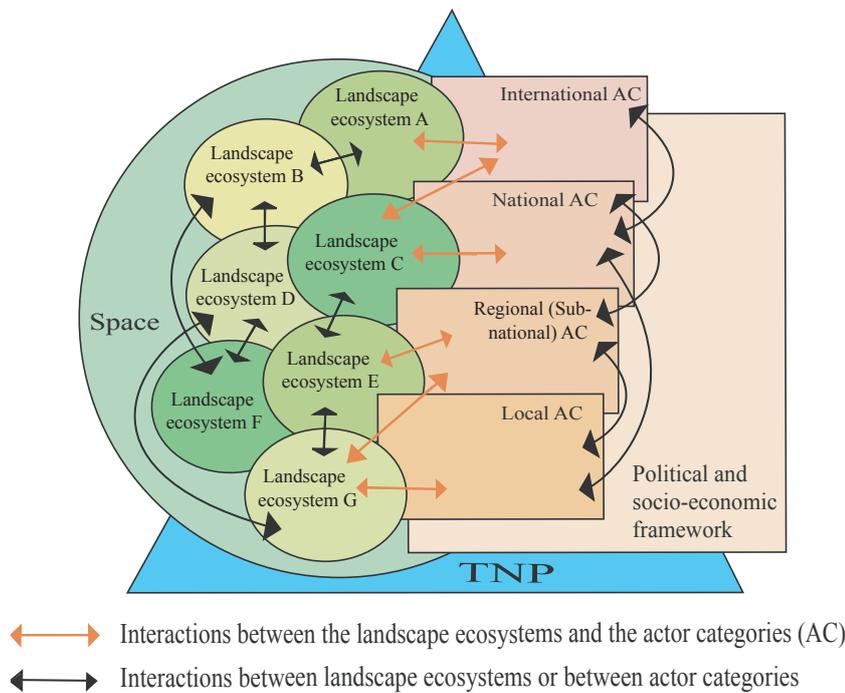


Figure 2.3: Overall model of the interactions between the landscape ecosystems and the actor categories within the Tajik National Park. The interactions manifest in different forms of resource use. These handlings base on different knowledge about and valuations of resources, interests and perceptions and thus differ between the different actor categories (own illustration according to the framework of the SDA (Hurni and Ludi, 2000, p. 21), the multi-level stakeholder approach (Hurni, 1996, p. 34), and the structural model of an actor-oriented perspective on regional development (Wiesmann, 1998, p. 45)).

the planning process and realisation of the park. By pointing out possible negative consequences of a non-participatory approach in the further realisation of the Tajik National Park, the park authority and other institutions should be inspired to revise the way they intend to proceed.

Main research question

What are the main objectives of the Tajik National Park from the point of view of various actor categories and how should these differently perceived objectives be assessed in light of the actual situation of nature conservation in the Tajik National Park?

Application areas and research questions

1. Assessing the target state of the Tajik National Park with respect to the views held by the different actor categories concerning the use and conservation of natural resources within the various landscape ecosystems.
 - What are the official aims of the Tajik National Park as represented by the park authority and with what instruments should they be implemented?
 - What objectives should the Tajik National Park follow according to the different actor categories?
 - How do the official aims of the Tajik National Park differ from the objective as assessed by the various actor categories?

2. Assessing the actual state of the Tajik National Park with respect to its landscape ecosystems, relevant actor categories and their interaction with respect to the use and conservation of resources.
 - How can the landscape ecosystems of the planned park be characterised?
 - What actor categories may be identified within the scope of the park project and what is their actual perception of the Tajik National Park?
 - What characterises the interaction between actor categories and the landscape ecosystems regarding the use and the conservation of natural resources from different perspectives?
 - What is the actual perception of the Tajik National Park of different actor categories and what are the discrepancies concerning conservation of natural resources?

3. Appraising the difference between the target and the actual state of the Tajik National Park and discussing the requirements for the implementation of sustainable use of resources within the park.
 - What are the differences between the target state and the actual state of the Tajik National Park with respect to the interests in ecologically sustainable development?
 - What are suitable concepts for sustainable development in this environment and can the Tajik National Park serve as an adequate method of resolution?
 - What are the requirements to realise ecologically sustainable development within the Tajik National Park with respect to the differences between claim and reality of the park?

Chapter 3

General features of the study area

The following chapter gives an overview about the natural and cultural characteristics of the Tajik Pamirs, in which the Tajik National Park is embedded. This overview shall serve as background information for part III of this thesis. Section 3.1 focuses on the spatial assignment of the Tajik National Park. Boundary questions of the park area are discussed on the international, regional and local scale¹. The second section gives an overview about the natural conditions, while section 3.3 focuses on the socio-cultural background of this mountain area.

The remarks of this chapter mainly focus on the area of the Pamir Mountains that is included into the Tajik National Park. However, sometimes the information refers to the whole area of the Pamirs that is covered by the Tajik Republic.

3.1 Boundary questions

Boundary questions are present on all spatial levels within the region of Central Asia and do not only refer to political matters. Similar to the discussion of state borders and the demarcation of administrative units, boundary questions also affect the Tajik National Park as a whole as well as parts of its territory.

The characterisations of the spatial units given below serves as definition of how these terms are used within this thesis.

3.1.1 Central Asia

According to Akiner et al., a boundary "can best be described as a four-dimensional kaleidoscope in which social, economic, political and cultural elements continually collide, overlap, merge, fragment, and reform" (1998, p. 7). Due to the cultural and ethnic complexity of Central Asia, its contour changed several times in the past. The demarcation of the region was defined on the basis of strategic and geopolitical considerations in the early 20th century (see section 3.3.1). Later on they were replaced by historical and cultural criteria and most recently, political and economic factors have emerged as potential boundary markers (Akiner et al., 1998).

During the Soviet era the Russians used the term 'Middle Asia' to refer to the southern republics of Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, while the term 'Central Asia' was used for the areas further east, including Mongolia, Tibet and Xin Jiang Uigur Autonomous Province of China. Since the collapse of the Soviet Union the term 'Central Asia' is most commonly defined as the area that includes the five former Soviet states Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan (Akiner et al., 1998, p. 4).

¹A detailed description of the selected study sites is given in chapter 5.

Within this thesis, the boundary of Central Asia is defined as the frontier of the five above mentioned newly independent states of the former USSR.

3.1.2 The Pamir Mountains



Figure 3.1: Location of the Pamir Mountains in the south-eastern corner of Central Asia. The main area of the Pamirs is located within Tajikistan (Breu and Hurni, 2003b, p. 15).



Figure 3.2: Typical landscape formation in the Eastern Pamirs. These extent plateaux brought the Pamirs the labelling 'Roof of the World' (Photo: A. Haslinger, August 2001).

The name Pamir, or Bam-i-dunya (Roof of the World), stems from Persian writers and is actually derived from the broad valleys in south-east Tajikistan. Since then the name has become expanded and it now comprises all mountains that are located between the Pandzh river in the south and the Alay range in the north, spreading over Afghanistan, China, Kyrgyzstan, and Tajikistan.

About 80% of the Pamir Mountains are located in Tajikistan, but its highest summit, Kongur Shan (7,719 m a.s.l.), is in China (Xin Jiang) (Gurung, 2003). The Tajik Pamirs are encompassed by the administrative area of the *Gorno-Badakhshanskaja Avtonomnaja Oblast* (GBAO), an autonomous province, that takes up 44.6% of the countries surface or 63,700 km² (about one and a half

time the area of Switzerland) (Kreutzmann, 2002).

The boundaries of the GBAO are marked by natural features. In the north, it is bordered by the ridge of the Transalai mountains (*Alayskiy Khrebet*), separating Kyrgyzstan from Tajikistan. In the east, the frontier to China runs along the ridge

of the Sarykol mountains while in the south, it is bordered by the Pandzh river that marks the border with Afghanistan.

Its western demarcation is set by the Darwas mountains and the ridge of the Academy of Science range, containing the highest peak of Tajikistan, Pik Ismoil Somoni (former named Pik Kommunizma, 7,495 m a.s.l.). All these mountain ridges enclose a high plateau that is located at an average altitude of 3,500 to 4,000 m a.s.l., containing rounded massifs and broad valleys that are referred to as the Eastern Pamirs. The Western Pamirs are characterised by large glaciers and deeply incised valleys (Breu and Hurni, 2003b). The splitting into a western and an eastern part runs along the 73 degree of longitude from Altyn Mazar in the north via Fedchenko glacier, Tanymas river to lake Sarez and lake Yashilkul to the Afghan border in the south. This border does not only separate different geomorphologies and climatic features, but also forms an ethnic and language border (see subsection 3.3.2).



Figure 3.3: Typical landscape formation in the Western Pamirs. The villages are located in deeply incised valleys with steep slopes (Photo: H. Kreutzmann, September 2002).

The borders of the GBAO were defined under Soviet ruling and were more or less the same for about 70 years, however, they changed in summer 2002 when some areas of Murgab *rayon* (Ran Kul *jemoat*) were ceded to China (oral information from ACTED, August 2002). Today the GBAO is split in seven districts, called *rayony*. With an area of 38,000 km^2 Murgab *rayon* constitutes the biggest district and covers the area of the Eastern Pamirs. The Western Pamir Mountains are subdivided into six *rayony* (cf. figure 7.8 on page 92.). Each *rayon* is divided again in *jemoats* (municipalities).

3.1.3 The Tajik National Park

The Tajik National Park, in the following referred to as TNP, is mainly located in the northern half of the GBAO but extends in its north-western corner to Dzshirgital and to the ridge of the Peter the First range (cf. figure 5.3).

The park area of 25,918 km^2 (in 2003) comprises extensive high plateaux of the Eastern Pamirs and steep slopes and huge glaciers of the Western Pamirs. However, similar to the borderline questions about the area of Central Asia, the exact demarcation of the TNP is still open.

The TNP may be roughly split into three parts. The western part is located west of lake Sarez and Fedchenko Glacier. The eastern part spans over Murgab *rayon* east of lake Sarez and the Beljandkiik valley. The region around lake Sarez, located in the heart of the GBAO and in the southern part of the TNP in the merging zone of the Western and the Eastern Pamirs, is referred to as central zone of the park (cf. figure 5.3 on page 57.).

3.2 The natural environment

The natural environment of the Tajik Pamirs and thus the TNP is characterised by numerous contrasts that meet each other on a relatively small area. Due to the variability in temperature and moisture, altitude and relief, the Tajik Pamirs harbour a multitude of landscapes and ecosystems that are responsible for great

diversity of life. This diversity forms a point of origin for the creation of the TNP (see part III).

3.2.1 Geology

The Pamir Mountains are a geologically rich and complex mountain range whose knot is the convergence area of several high ranges. These include the Hindu Kush Mountains from the south-west, the Karakorum Mountains from the south-east, the Kun Lun Mountains from the east, and the Tien Shan Mountains from the north-east. This high mountain complex situated between the Tarim and the Karakum basins is inclined to the west and drained by the Amu Darya (Alford et al., 2000). Most mountain ranges of the Pamirs strike from southwest to the east (Agachanjanz, 2002).



Figure 3.4: Lake Sarez as seen from Dzhilgakul area. This lake was filled up after an earthquake that caused a rockfall in 1911 (Photo: A. Haslinger, September 2001).

The Pamir Mountain belt is a direct consequence of the continent-continent collision of the north-west corner of the Indian plate with Eurasia. This convergence process is still going on and causes intense seismic activity in the Pamirs. Tremors are frequent, making the sensitive slopes less stable. In 1911 an earthquake (6.5 to 7.0 on Richter Scale) caused a rockfall that blocked the Murgab river and formed a natural dam. With a height of over 550 meters, Usoi dam is the tallest dam, natural or man-made, in the world. In the following years, lake Sarez was filled up. Today the lake has a length of 60 km. The 'Sleeping Dragon of the Pamir', as lake Sarez is often called, represents a risk associated with an unexpected dam burst that would flood vast areas of densely populated valleys (Vladut et al., 2003). Similar to lake

Sarez, scientists assume that also lake Yashilkul close to Bulunkul was filled up after a rock fall caused by an earthquake a long time ago (Curzon, 1896). Most other lakes in the Pamirs however are of tectonic origin (Savvaitova and Petr, 2003).

The Pamir Mountains contain numerous mineral resources. Mining was conducted a long time before the Russians controlled the area². Deposits exist of metallic ores, building stones, evaporates, gemstones, and coals (Breu and Hurni, 2003b). However, due to the high costs of exploitation in the remote mountain areas and the instable political situation of the last years most deposits in the Pamirs are not mined today.

3.2.2 Climate and hydrology

The Pamirs, located inside the Eurasian land-mass, have a continental climate characterised by accentuated seasonal and daily fluctuations in temperature and high aridity. Due to its location far away from any sea the little moisture transported by winds from the Indian and Atlantic Ocean is blocked by the surrounding ridges of the high mountains. From this it follows that whereas in other mountain ranges the quantity of precipitation increases with the altitude, the quantity of precipitation

²During the 9th century, different treasures of the soil were made accessible and the first mines arose in the Pamirs. In the Bazardara valley, northeast of Alichur and inside the area of the TNP, the most famous mining city was built. It contained a caravanserai, a temple of fire, a cemetery, a heathen bath and a centre for administration. Ruins of this city may still be seen today (Bubnova and Hauser, 2003, p. 6).

in the Pamirs is more dependent on the orientation of the mountain ridges than on the altitude (Akramov et al., 1999).

The Western Pamirs are counted among the Fore-Asian sub zone of dry climate with moderately warm summers and moderately severe winters (Badenkov et al., 1992). Mean summer temperatures below 2,500 m a.s.l. are between 18°C and 22°C, in winter the mean temperature is between -10°C and -5°C. Rainfall mainly occurs in winter and early spring (cf. figure 3.5: climate diagrams of Irkht and Bulunkul). Total precipitation is 300 to 500 mm on leeward slopes and increases to 1,200 to 1,800 mm on windward slopes (Badenkov and Buzurukov, 1993). Along the Pandzh river a north-south gradient of precipitation exists: In Kalai-Khumb (Darwaz *rayon*) the annual precipitation exceeds 600 mm while in Ishkashim it only reaches 100 mm. The maximal amount of rainfall may be registered with a mean of 2,234 mm around Fedchenko glacier on 4,300 m a.s.l. (Breu and Hurni, 2003b). Precipitation is much lower at the same altitude in the southern mountain ranges.

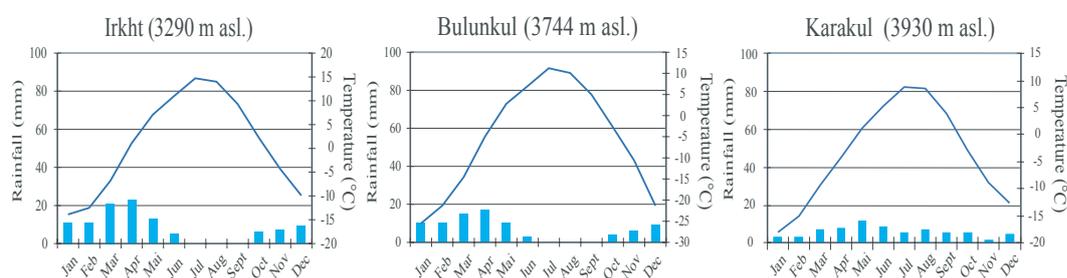


Figure 3.5: Climate diagrams of different Meteo stations located inside the TNP: Irkht (lake Sarez) and Bulunkul represent the climatic conditions in the centre of the TNP. They are located along the segue from the Western to the Eastern Pamirs and show a regime typical for the Western Pamirs. Karakul, located in the eastern part of the TNP, indicates the typical climatic conditions of the Eastern Pamirs (Meteoservice of GBAO, 2002).

The Eastern Pamirs belong to the zone of dry climate with cold summers and severe low-snow winters (Badenkov et al., 1992). The average annual temperature is mainly below zero (-1°C to -6°C). Average summer temperatures are between 4°C and 10°C. During winter they range between -25°C and -18°C (Badenkov and Buzurukov, 1993). The absolute minimum was observed within the surroundings of Bulunkul with -63°C in the winter of 1959 (oral information from Meteoservice of GBAO, Station Bulunkul, September 2002). Due to the high altitude and the arid atmosphere of the Eastern Pamirs, the solar radiation influx (insolation) is very high. During the day the sun intensely heats up the surface, but during the night almost all heat reflects into the atmosphere. This leads to intensive daily variations of temperature in the layers close to the ground and supports weathering processes of the soil. The limited rainfall reaches its peak in late spring and early summer with a mean annual precipitation of 70 to 120 mm (cf. figure 3.5: climate diagram of Karakul). However, as a characteristic of arid climate, precipitation is highly fluctuating in the Eastern Pamirs. Snow does not occur in large quantities but still has a great impact: When the fine layers of snow are intensely frozen they prevent wildlife and livestock from accessing any food. Fortunately this does not happen every year. The quality and quantity of the fodder base on pastures is highly dependent on the amount of precipitation in form of rain as well as on the amount of snow (cf. section 9.1).

The severe climate of the Pamirs constrict human activities, but at the same time it is influenced by human encroachments into nature. According to Badenkov et al. (1992), irrigation and water reservoirs constructed for hydro plants are changing

local climates. Irrigation in dry climate causes an increase in evaporation and thus heat loss. Evaporation, as well as turbulent heat exchange between water surface, atmosphere and deeper water layers, lead to a lower air temperature along water shores compared with areas away from the water. During the last years the average annual temperature increased almost in all regions of the Pamirs between a half and two degree Celsius compared with the normal means of 1931-1960. Alongside with the temperature change, precipitation became more fluctuating, ranging between 50% and 180% of the mean annual rainfall (Novikov and Safarov, 2003c).

The Pamirs are the main water reservoir of Central Asia. The area gives rise to the major rivers of Central Asia, the Amu Darya and Syr Darya. The rivers are fed by the huge glaciers of the Pamirs, by snowmelt, rainfall and groundwater (Badenkov et al., 1992). On their way to the Aral sea these rivers supply numerous oases of the vast desert areas and support life of millions of people inhabiting the Central Asian lowlands (Badenkov et al., 1992). However, already in the narrow mountain valleys bordering the TNP, river water is intensely used for the irrigation of crops and thus enriched with salts that are leached out of the fields (Eicher, 1995).

3.2.3 Geomorphology and soils

Geomorphologically, the Pamir Mountains are divided into two parts. The Western Pamirs are distinguished by the relief, made very uneven by erosive and tectonic processes, and its narrow steep-sloped river valleys. The Eastern Pamirs contain wide accumulated valleys and lake hollows, found at a considerable height (Agachanjanz, 2002).



Figure 3.6: Cryogenic processes lead to the formation of hummocks along water bodies. These bulden and the accumulation of salt impede mowing (Photo: A. Haslinger, August 2001).

Generally, the Pamir Mountains have a peculiar structure of vertical zoning of topsoil. In accordance with the climatic zoning of the Pamirs, five soil types may be distinguished. Light brown soils formed under grass steppes are found between 1,800 and 3,200 m a.s.l. They reach a depth of 135 cm and contain up to 3.0% of humus in the A layer. This soil is followed by the high mountain steppe-desert soil belt that reaches an altitude of 4,700 m a.s.l. in the Western Pamirs. The humus quantity reaches 4.2%. In the Eastern Pamirs the soil belt in this same altitude is described as a high mountain soil belt that is mostly stony and underdeveloped. These soils are formed on deposits of stone, detritus and pebbles and contain

very little humus in the A-layer. Vegetation on this soil is characterised by high mountain deserts, steppes and cryophyton plants (cf. subsection 3.2.4 below). In the Eastern Pamirs, closed soil layers with a developed A-layer are only present along river flood lands and lake depressions. These hydro-morphine soils are also found in the Western Pamirs. They often contain meadow vegetation with a level of subsoil waters of 0.3 to 2 m. Especially in the Eastern Pamirs, evaporation of subsoil waters cause an accumulation of a salt layer on its surface. Seasonal freezing determines the development of cryogenic processes with the formation of hummocks (*bulden*). Even though vegetation cover is relatively dense on these soils, their use is sometimes limited to grazing by livestock since mowing is not feasible on these hummocks (Akramov et al., 1999).

3.2.4 Biology

Vegetation

The Pamir Mountains belong to the Iran-Turan floristic zone. The western part of the Tajik National Park is attached to the Turkestan province of the Fore-Asian sub zone, the Eastern Pamir Mountains are part of the Tibetan province of the Central Asian sub zone (Badenkov and Buzurukov, 1993).

Vegetation of the Pamir Mountains has to adapt to a harsh climate and extreme conditions. The vegetation period is very short (60-80 days) and contains no frostless time (Aknazarov, 1999). Diverse altitudinal belts, different microclimatic conditions caused by different exposition, precipitation, slope inclination and different soil composition, lead to the development of a highly specialised, diverse flora. According to Badenkov and Buzurukov (1993), the area of the TNP (in 1992) contains over 900 vascular species of plants that belong to 75 families. The greatest variety of species may be found in the Western Pamirs where arboreal and shrub species dominate. In the high altitude and especially in the eastern part of the park small shrubs, semi shrubs, and annual and biennial forbs prevail. Almost two thirds of the vegetation of the GABO (2,200 species of higher plants) are concentrated in the middle mountains between 1,700 - 3,400 m a.s.l., 32% occur in the middle mountains and high mountains, but only 14.7% of the species are specific to the high mountain area (Ikonnikov, 1960). Badenkov and Buzurukov (1993) state the total number of endemic species within the national park area of 1992 with 114 (e.g. Fedchenko willow, Shugnan birch, Kayon pear, etc.). According to Krever et al. (1998), up to 18 - 20% of the higher flora is represented by species with narrow ranges in Central Asia. This high degree of endemism is characteristic for the biodiversity of the region.

The vegetation types are unevenly distributed throughout the Pamirs. Generally, vegetation belts grow to higher altitudes in the Eastern Pamir ranges than in the Western Pamirs (NABU, 2002). In the Eastern Pamirs the exposure of the slopes cause a striking differentiation of the vegetation respectively their altitudinal distribution. On southern slopes insolation is maximal and brooks are only fed by snow in spring and early summer, while on northern slopes, insolation is minimal and thus brooks are fed by glaciers all year round. Table 3.1 gives an overview of the main vegetation types of the high altitude within the TNP and their altitudinal distribution in the western, central and eastern park area.

Other vegetation types may be found in the lower parts of the western park area and only account for a small area. Mountain *Ju-*



Figure 3.7: Woody sub-shrubs grow very slowly at this altitude. This small example of teresken is estimated to be aged 20 to 30 years (Photo: R. Lüthi, August 2002).



Figure 3.8: Single willow trees along the river Tanymas. Due to climatic conditions and human impact, forest stands are extremely fragmented in the Pamirs (Photo: A. Haslinger, September 2001).

Table 3.1: Vegetation types of the high mountain areas within the TNP and their altitudinal distribution in the western, central and eastern park area (according to NABU, 2002; Sukachev, 1960; Lüthi, 2003).

Plant communities	High mountain deserts	Highmountain xerophytic vegetation	High mountain steppes	Cryophyton
Characterisation and main vegetation species	<i>Artemisia</i> species in association with <i>Ceratoides papposa</i> , <i>Acantholimon</i> . Sometimes enriched with steppe elements such as <i>Festuca</i> and <i>Poa</i> species. Coverage 20 - 60%	Small zone of about 500 m extension. <i>Acantholimon</i> species in association with <i>Ajania tibetica</i> and <i>Ceratoides papposa</i> . Coverage 10 - 60%	<i>Festuca</i> , <i>Poa</i> , <i>Stipa</i> and <i>Alhium</i> species	Alpine and cushion flora and meadows with <i>Oxytropis</i> , <i>Potentilla</i> , <i>Leontopodium</i> species and <i>Ajania tibetica</i> . Coverage 10 - 60%
Western Pamirs (Gunt & Bartang valley)	2,100 - 3,200 m a.s.l.	3,000 - 3,600 m a.s.l.	3,300 - 4,100 m a.s.l. Coverage 50 - 100%	3,900 - 4,500 m a.s.l.
Central Pamirs (around lake Sarez)	2,600 - 3,950 m a.s.l. Containing <i>Salsola</i> species	3,700 - 4,300 m a.s.l.	3,500 - 4300 m a.s.l.	4,200 - 4,800 m a.s.l.
Eastern Pamirs (around lake Karakul)	Up to 4,200 m a.s.l. Often only dominated by <i>Ceratoides papposa</i>	4,000 - 4,600 m a.s.l. (southern slopes only). Coverage 15 - 40%	4,000 - 4,600 m a.s.l. (on northern slopes)	over 4,500 m a.s.l.

niperus vegetation build small stands on rocky ground around lake Sarez below 3,500 m a.s.l. and on small surfaces of the western valleys. Mountain small-leaf forests develop in the river plains under arid and sub-arid conditions at the altitude of 2,300 to 3,500 m a.s.l. They are mainly composed of *Betula*, *Salix* and *Populus* species and often associated with *Hippophaea* and *Tamarix* species (Novikov and Safarov, 2003d). Flooding of their stands often cause succession processes in the undergrowth. Other shrubby plant communities contain in different combination *Myricaria* and *Rosa* species and mainly occur along rivers and scree of the western valleys. Shrub vegetation in the Eastern Pamirs only grow in deep river valleys and contain low *Betula turkestanica* and *Salix* species, as well as *Berberis kaschtarica* and *Hippophaë rhamnoides* (NABU, 2002).

Arboreal and shrub vegetation often contain wild fruit and nut trees such as walnut, apple, plum and hawthorn in the Western Pamirs and sea buckthorn, barberry and currant in the Eastern Pamirs. Ashurov (1999) assessed these fruits, berries and nuts as an insufficiently used source of food. He explains that the seeds could be used for growing drought-resistant plants for mountain gardening. Furthermore, wild fruit and nut trees are valuable for preventing erosion on mountain slopes and strengthening river banks (Ashurov, 1999).

Meadows and petrophytes are plant communities that are limited to special habitats. Meadow vegetation is composed of species that reach a high plant coverage of 70 to 100% on very moist habitats such as river plains and marshes around lakes. *Carex* plant communities occur to an altitude of 4,300 m, *Kobresia* plant communities may also be found on middle-moist soils up to 5,000 m a.s.l. (NABU, 2002). These plant communities constitute an important source of food for wildlife and livestock.

Petrophytes are plant communities on scree. The species composition on this habitat is relatively diverse and very variable according to the altitudinal levels. Plant cover is also very variable since the surface of scree is always in movement. The plant communities are characterised by half shrub and shrub plants, namely *Artemisia*, *Ephedra*, *Ribes*, and *Cicer* species (NABU, 2002).

Special vegetation types are increasingly under pressure by intensified human use, especially since the process of transformation. Affected are namely woody vegetation such as small-leaf forests and woody sub-shrub stands (particularly *Ceratooides papposa* and different *Artemisia* species) including numerous wild fruit and nut species as well as some steppe vegetation and cryophyton plants. Wood and woody sub-shrubs are used in the whole area as substitute for coal and other fuel. Meadows and petrophytes are intensely used as pastures and hay fields. Due to a short vegetation period they may hardly recover once they are overused. The use of vegetation will be further described in chapter 8.

Wildlife

The area of the TNP is characterised by a fauna that is well adapted to high mountain ecosystems and harsh climatic conditions. Most famous is the mega fauna of the Eastern Pamirs, including the Marco Polo sheep (*Ovis ommon polii*, Siberian ibex (*Capra ibex sibirica*), and snow leopard (*Uncia uncia*).



Figure 3.9: Vegetation is often limited to locations providing enough moisture. This leads to small scale habitat structures in the Pamirs (Photo: A. Haslinger, August 2001).



Figure 3.10: A group of Marco Polo sheep on the run in Muzkol area, causing a dust cloud (Photo: A. Haslinger, September 2001).

Marco Polo sheep and snow leopard are classified as vulnerable species and included in the Red Data Book (RDB) of the Tajik Republic. Other species included in the RDB are the Tien-Shan brown bear (*Ursus arctos isabellinus*) and the Central Asian otter (*Lutra lutra seistanica*). Many bird species are classified as vulnerable, such as the Indian goose (Mountain goose) (*Anser indicus*), the Tibetan snow cock (*Tetraogallus tibetanus tibetanus*), the lammergeier (*Gypaetus barbatus*) and the Golden eagle (*Aquila chrysaetus*). The Tibetan sandgrouse (*Syrrhaptes tibetana*) and the Saker falcon (*Falco cherrug milvipes*) are classified as endangered bird species of the Eastern Pamirs. The Turkestan lynx (*Felis lynx isabellina*), also endangered, occurs within the whole area of the GBAO.

Other animal species that are common in the area of the national park include the wolf (*Canis lupus desertorum*), Red Fox (*Vulpes vulpes Pamirsensis*), Long-tailed marmot (*Marmota caudata*), the Tolai hare (*Lepus tolai pamirensis*), the pika (*Ochotona roylei*) and bird species such as the Ruddy sheld duck (*Tadorna ferruginea*), and the Himalayan snow cock (*Tetraogallus himalayensis himalayensis*).

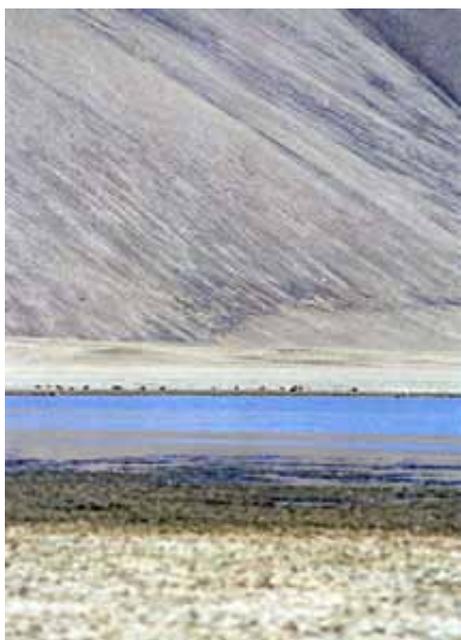


Figure 3.11: Small mountain lakes like Dzihlgakul (Muzkol area) provide resting places for numerous species of migratory waterfowl (Photo: A. Haslinger, September 2001).

Pamir lakes are inhabited by only a small number of fish species, such as false osman (*Schizopygopsis stoliczkai*), marinka (*Schizothorax intermedius*) and Karakul stone loach (*Noemacheilus lacusnigri*). The latter is an endemic species of lake Karakul. During the Soviet period, gibel carps (*Carassius auratus gibelio*) were introduced and released in different lakes, namely lake Bulunkul. Some fish species show a number of morphological and anatomical adaptations which help them to tolerate the harsh high-altitude conditions (Savvaitova and Petr, 2003).

As a whole, wildlife is rather limited in the Pamirs, with only 20 species of mammals and a complete absence of insectivores and bats (Kuznetsov, 1948). In winter, fauna is especially poor, because the numerous migrating birds and waterfowl only stay around the numerous mountain lakes during the short summer period (WWF, 2002).

The deteriorating economic situation in the wake of the transition, as well as the introduction of international trophy hunting, led to an overall increase in pressure on wildlife, particularly on the Marco Polo sheep (Breu and Hurni, 2003b, p. 28). Population figures for this species are highly disputed and range between 3,000 animals (census of the Pamir Biological Institute and the Nature Protection Committee in 2000/01) and 39,000 animals for the whole GBAO (census done by SCI and WWF in

2002)³. No matter how much these numbers diverge, a decline in the population dynamics may be found since the 1970s.

³For a detailed description of Marco Polo sheep numbers see Boschi et al. (2002), Lüthi (2003), Shackleton and Group (1997) and Krever et al. (1998).

3.3 Socio-cultural aspects

The location of the Pamirs in the inner part of the Eurasian continent determines not only the natural features of the environment, but also its economic and political environment (Krever et al., 1998, p. 19). The economy of the GBAO is primarily based on the exploitation of natural resources. From this it follows that projects such as the TNP are mentioned with respect to economic aspects by numerous interviewees (see part III).

The use of natural resources is not only influenced by the economy, but also characterised by the culture and demographical development within the Pamirs. The cultural diversity led to the development of numerous strategies in dealing with natural resources within a small area. Especially since the civil war that followed independence, the demographic development of the Pamirs has aggravated the pressure on certain natural resources.

The actual state of the TNP and especially the discussion about its border line is closely linked with the history of the Pamir Mountains, since this area has marked borders of different realms for a long time. The historical view goes back to the end of the 19th century, however, already in ancient times the Oxus (Amu Darya) has bounded the spheres of influence of different powers in this region.

3.3.1 History

At the end of the 19th century the Great Powers Russia and Great Britain settled their spheres of influence within Central Asia in the so called Great Game. In 1875 Russia and Britain established borders between Turkestan, a colony of Russia, and Afghanistan, which was controlled by the British. This artificial border had dramatic consequences for the local inhabitants. Settled areas were split, pasture areas of mobile pastoralists were divided, and resident people were separated from their ethnic groups (Eicher, 1995).

Following the Russian Revolution in 1917, Turkestan became nominally Soviet and Tajikistan was included in the Turkestan Autonomous Soviet Socialist Republic (ASSR). To avoid a fusion of the Turk groups within the region, the Turkestan ASSR was split into six single so called titular republics, every one representing with its name only one ethno-linguistic group that constituted only about two third of the population. During this nation-building process, Tajik-speaking people of the Soviet Union were separated between the Tajik SSR and the Uzbek SSR. Kyrgyz people were split among the Tajik SSR, Kyrgyz SSR and also the Uzbek SSR (Akiner et al., 1998).

In 1925 the so called backward mountain region of the Pamirs was integrated as autonomous administrative area *Gorno-Badakhshanskaja Avtonomnaja Oblast* (GBAO) in the Tajik SSR. This special status was regarded as necessary to reduce the deficit of development as soon as possible. From now on activities in all spheres of life were organised and controlled by the Soviet state. Collectivisation was fostered and people from the Western Pamirs were forced to resettle in the cotton-*sovkhozy* in the lowlands (Akiner et al., 1998). The economy was geared toward the supply of raw material and the country became strongly dependent on the import of food, energy resources and fodder from outside. Residents of the main villages were provided with coal, food, electricity, running water, and public infrastructure such as roads, bath houses, hospitals and schools. Alphabetisation was fostered and many resident people got a job outside the farming sector. The education of women and their integration into the economy had a deep impact on the traditional gender roles. Women's work was no longer confined to the household and they became active as teacher, nurse, secretary etc. However, these options were often limited to the cities or to regional centres. Due to their geopolitical role as the southern border of the

Soviet Union, the Pamirs were made accessible from the north by the construction of the Pamir Highway, linking Osh in Kyrgyzstan with Khorog, the administrative centre of the GBAO.

In 1991 Tajikistan declared its independence. Soon afterwards, fighting broke out and the country slid into a civil war (1992 to 1997). The Pamirs became an asylum for all those Pamiri people who were working outside the GBAO, where they were exposed to offences since their membership to the Ismailiya (see below). With independence, the external supply discontinued and the country faced a dramatic transformation that affected all spheres of the state and its population, but was most severe in the remote mountain areas of the Pamirs. There was no provision to compensate the absence of outside supply and the Pamiri people were threatened by famine (Kreutzmann, 2002, p. 40). With the support of the Aga Khan Foundation (AKF) in 1992, humanitarian aid in form of flour, milk powder, oil, and legume arrived (Herbers, 2001, p. 371). Until today, the supply of food remains difficult in the Pamirs and parts of the population are still dependent on humanitarian aid Ruef (2002).

Ten years after independence, the geopolitical position of Tajikistan again gained the attention of the West when US and European armies moved into Afghanistan. These unhappy events fostered the linking of the remote area with the outside world in terms of communication (particularly internet connections were established in the centres). At the same time the governments of the Central Asian states raised the idea to re-establish the Great Silk Road and to foster their economic and political cooperation. The Pamirs should keep their strategic position and serve as connecting area between cultures and facilitate the exchange of economic goods. Therefore the government invested in new infrastructure. The Eastern Pamirs were linked with China (markets in Yarkand and Kashgar) and the Karakorum Highway via the newly built Kulma road. The Western Pamirs were connected with the Afghan side by the construction of bridges across the Pandzh river, particularly around Khorog. However, these links are not yet open for the public and the (re)integration of the Pamirs into the region, including the lowland areas in all directions, is still only beginning.

3.3.2 Culture

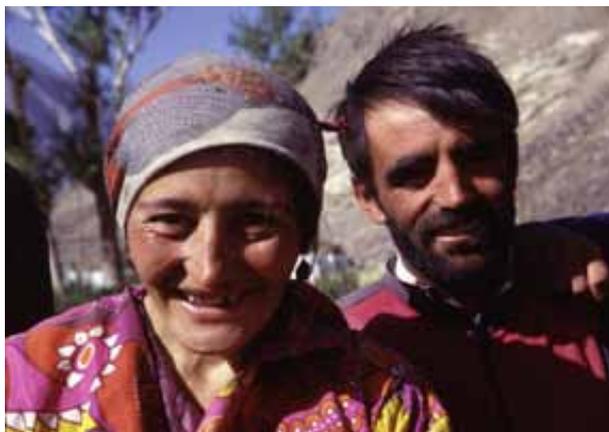


Figure 3.12: A Pamiri couple from the upper Bartang valley (Bartangi) (Photo: H. Kreutzmann, September 2002).

The Tajik Pamirs are inhabited by two main ethnic groups. Numerous subgroups of the Western Pamirs are summarised as Mountain Tajiks. The vast areas of the Eastern Pamirs are mainly inhabited by Kyrgyz people.

Mountain Tajiks, the Galchas of ancient times, stem from early migrants from Persia. Since centuries they are sedentary in mountain oases and depend on irrigation for crop and fruit cultivation. The purely geographic names of Mountain Tajiks or Pamiri people correspond neither to a real ethnic unit, nor to an indigenous appellation. The groups call themselves by names derived from their places of origin. Four of them, the Rushanis, Shughanis, Ishkashimis and Wakhis, are also to be found in north-east Afghanistan (Centlivres and Centlivres-Demont, 1998, pp.

4–5). The areas around Dzhirgatal and Tavildara are inhabited by Tajik groups from the lowlands.

The Kyrgyz, formerly nomadic Turk people, migrated from the region of the upper Yenisei river to settle in the area that is now split among Afghanistan, China, Kyrgyzstan and Tajikistan. They were living as mobile pastoralists and traded their products with the cities in the Ferghana valley and China. Under Soviet ruling they were sedentarized in the 1950s. Today, many of them restarted spending the summer months in the felt yurt on the high pasture, breeding sheep and yak. The Kyrgyz from the Tajik Pamirs are called Karakyrghyz (black Kyrgyz) and differ from their people living in the lower areas of Kyrgyzstan in dialect and other cultural attributes (Richter et al., 2002).

Each group inhabiting the south-western valleys of the GBAO speaks its own dialect. The languages of the Pamiri people are related to the eastern Iranian languages, while the state language (Tajik) derives from western Iranian languages and is spoken in the north-western *rayony* Darwas and Vanch (Kreutzmann, 2002, p. 31). Tajik dialects are not understandable to Pamiri people. Kyrgyz, Pamiri and Tajik people mainly communicate in Russian with each other. Only people living along the cultural border between the Western and the Eastern Pamirs are able to speak Kyrgyz and Pamiri dialects.

Islam was introduced in the Pamirs in the 8th century and replaced Zoroastrianism, Buddhism, Manichaeism, and Nestorian Christianity. Today the Pamiri population in the western *rayony* Rushan, Shugnan, Roshkala, and Ishkashim are members of the Ismailiya, a Muslim confession guided by their spiritual leader Aga Khan. Most Kyrgyz people in the Eastern Pamirs and the Tajiks from Vanj and Darwaz are of Sunni Muslim confession (Kreutzmann, 2002).

During the Soviet ruling, Communists tried to root out Islam and introduce atheism. The sovietisation of the whole region radically changed the traditional ways of living of the people inhabiting the Pamirs which were strongly connected to their cultural identity. The 'sedentarization' of formerly nomadic Kyrgyz people and the resettlement of some Pamiri people to the lowland to work on the cotton plantations thus had a deep impact on the traditional cultures of this area. Tajik as well as Kyrgyz culture may only be practised in public since the collapse of the Soviet Union. This is seen as great advantage by many residents of the Pamirs.

3.3.3 Demography

Although the GBAO makes up 44.6% of the country's territory, it accommodates only 3.4% of its population (Herbers, 2001, p. 368). In 2000 about 220,000 people lived in the GBAO (Breu and Hurni, 2003b, p. 10). 90% of them are concentrated in the narrow river valleys of the Western Pamirs which form the edge of the park area. The Eastern Pamirs (Murgab *rayon*) are at the same time only populated by 16,000 people (see figure 3.14). The birth rate in the GBAO is with about 3% high (Badenkov and Buzurukov, 1993, p. 123) and cause a heavy dependency ratio, meaning that the working-age population must support an unusually high number of dependents (Eicher, 1995, p. 327).

During the Soviet period, many Pamiri moved to the lowlands. In the 1940s Stalin resettled people from the Western Pamirs to the lowlands. Later, Pamiri migrated to the urban centres in search of work (Kreutzmann, 2002). However, at



Figure 3.13: A Kyrgyz couple living in the Eastern Pamirs (Photo: R. Lüthi, October 2002).

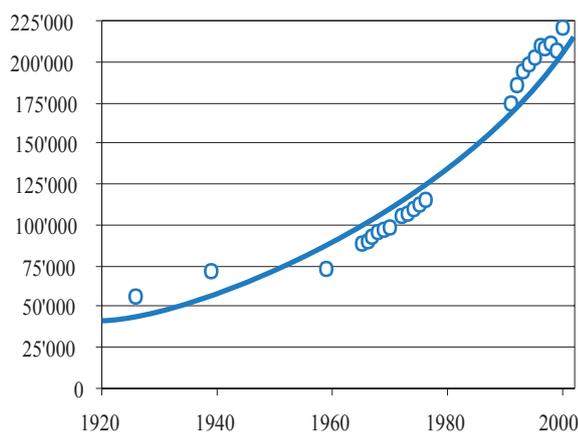


Figure 3.14: Population growth in the GBAO 1926-2000 (Breu and Hurni, 2003).

the same time the Pamirs were strongly supported by the government. Investment in health care, infrastructure and economy fostered the population growth (Umarov, 1998). During the civil war many people moved back to the Western Pamirs. Thus the population was increasing fast in the mountain valleys, while in the Eastern Pamirs some Kyrgyz people moved to the urban centres in Kyrgyzstan (Umarov, 1998). Since the beginning of the new millennium, Tajik people are more and more migrating to the eastern part of the Pamirs because the populated areas in the narrow valleys become crowded and people are looking for new space, as a member of ACTED confirmed.

3.3.4 Economy

The breakdown of the Soviet Union was followed by an economic collapse in almost all republics of the CIS, but most severely hit Tajikistan and the remote areas of the Pamir Mountains. Under the system of centralised economic planning the Tajik national economy was formed "as one plant with one administration" (Kazakov, 1933 in: Badenkov, 1990, p. 135). Thus the Tajik economy, aligned to the production of cotton as a raw material in the lowlands and the production of meat in the Pamirs, was an integral part of a superior structure but not able to function on its own. This was dramatically made clear when the Soviet system broke down.

During the Soviet period, industry was almost absent in the GBAO and the region was specialised in agriculture. The farming system became adapted to the mountain conditions as assessed by Russian experts and focused on the breeding of livestock (Eastern Pamirs) and the production of tobacco and fodder for livestock (Western Pamirs). Private land was socialised and unified in numerous *kolkhozy* and *sovkhozy* (Herbers, 2001, p. 370). As a consequence, self-sufficiency decreased to about 10 to 20%. According to Herbers (2001, p. 371), only 25.4% of the cultivated areas were used for the production of foodstuffs in 1987. With the improvement of infrastructure (construction of roads, import of a variety of machines and trucks, construction of support stations on remote pastures) almost all area that was appropriate as pasture was used. Since winter fodder was imported from the neighbouring regions, the system was not dependent on the limited availability of local winter fodder in the Pamirs. Thus the amount of livestock could be increased significantly (see figure 3.15).

However, due to the establishment of a planned economy and a specialisation as supplier of raw material, the Pamirs (as well as whole Tajikistan) became totally dependent on supply from outside. Besides winter fodder, huge amounts of fuel and food were imported from the lowlands (Kreutzmann, 1996, 2002). While certain

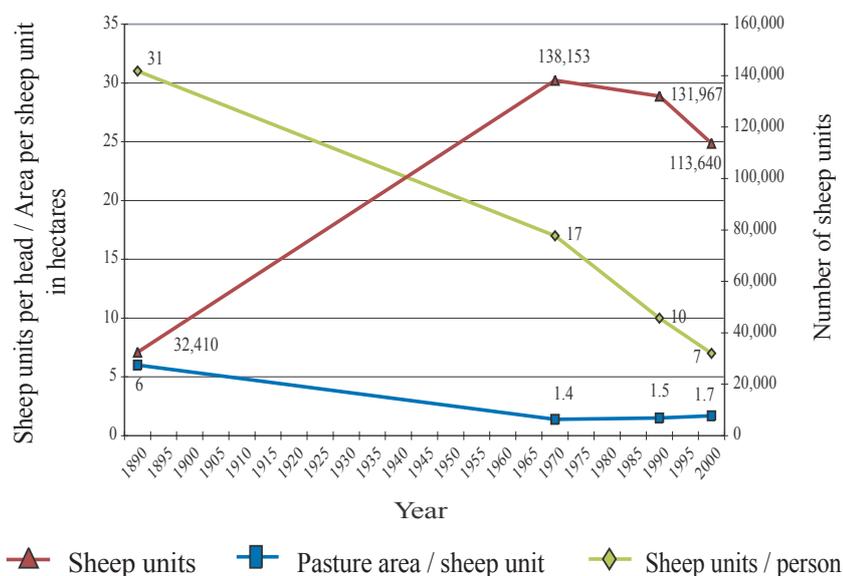


Figure 3.15: Development of livestock numbers (in sheep units) and its relation to the pasture area and human population in Murgab rayon 1890 - 2001 (illustration from Domeisen, 2002; based on Hedin, 1899 and Agroprom Murgab, 2001).

natural resources such as pastures were intensely used, the import of coal caused a resting period for other local resources such as wood and woody sub-shrubs (cf. chapter 4).

The workers became state employees with fixed salaries independent of the state farms' profitability. Most of these newly created jobs were in the non-agricultural sector (Herbers, 2001, p. 371). However, there was a lack of jobs in the GBAO and many Pamiri migrated to the lowlands to find a job outside the agrarian sector or to improve their education. They became teachers, engineers, physicians and intellectual (Herbers, 2001, p. 371).

With the collapse of the Soviet Union almost all supply from outside was put down. The transition from a planned to a market economy led to increasing unemployment and many people who held official jobs in the old regime changed to subsistence form of agriculture and livestock breeding (Breu and Hurni, 2002, p. 6). Thus local natural resources became very important for self-subsistence activities again. However, due to resettlements of Pamiri people to the lowlands and the specialisation of agriculture in the Pamirs during the Soviet era many people were not familiar with agriculture anymore (Umarov, 1998). Their links with the long-established mountain way of life were broken and their contacts with the mountains became 'consumerised'. Their (traditional) knowledge of farming and their equipment were poor, thus both people as well as the environment began to suffer from unadapted land use (Umarov, 1998). Since the cultivation of cash crops (such as cotton in western Tajikistan) is not profitable on the small plots in the Pamirs, the Tajik government enacted the Land Code, a law regulating the restructuring of land ownership. By 'privatising' land, self-supply should have been increased⁴ (Herbers, 2001). According to Herbers (2001), the conversion of this law led to an increase in self-sufficiency (by 1998 about 60% of the required foodstuff was produced in the region) even though the land per capita remained very small⁵ and people were not able to live on cultivation alone. Despite a lack of fertilizer and fuel for farming equipment that led to a reduction of the total area of land in production and

⁴In fact the land remains the property of the state, but a lifelong lease on land can be granted to private farmers. According to Herbers (2001), 82.2% of arable land of the GBAO was 'privatised' in 2000.

⁵On average, a household received 0.37 ha of land (Herbers, 2001, p. 375).

a decrease in soil and pasture fertility (Kreuer et al., 1998, p. 21), the output in agriculture could be increased in the GBAO. This may be explained by a change of cultivation. Instead of fodder, people restarted to cultivate cereals, beans, potatoes and vegetables.

At the same time the amount of meat and milk produced in Murgab *rayon* and in the whole GBAO clearly decreased⁶ (Breu and Hurni, 2002). The livestock of most state farms was distributed among the employees but these people working as teacher, technician or scientific employee before had hardly any experience in livestock breeding. Furthermore the amount of livestock per family was often small and thus many people could not increase their number of livestock to an amount to be able to live on it alone⁷.

As described by Kreutzmann (2002, pp. 42–43), the conditions in Tajikistan become more and more conformed to the ones on the other side of the river Pandzh in Afghanistan. Fuel and spare parts for technical equipment are missing in the Tajik Pamirs and thus a reversion to traditional techniques can be observed. Cereals are again harvested by hand and threshing is done with donkeys and oxen.

⁶According to local statistics, Murgab *rayon* hold 65,000 sheep and goats and 14,000 yaks in 1985. This number shrank to 35,000 sheep and goats and 11,000 yaks in 1996. Only from 1999 on livestock numbers started to increase again but on a low level.

⁷According to Hangartner (2002, p. 76), about 30 sheep units per person are necessary to be able to live on livestock breeding in the Pamirs.

Part II

Concepts and Methodology

Chapter 4

Concepts and Approaches

This chapter gives an overview about the theoretical background that was conducive for this thesis. In addition, several terms are defined to clarify their further use. The chapter is split into four sections. The first section gives a short introduction to the overall concept of sustainability and its relevance for mountain development. This concept constitutes the overarching frame for all following concepts outlined in section 5.3. In the second section important terms related to the use of resources and their conservation are discussed to clarify their denotation. Sections 5.3 outlines different concepts focusing on the ecological dimension of sustainable development that integrates the use of resources and nature conservation. The structure of this section follows the formation of ecological sustainable development as outlined in figure 4.2. The last section finally highlights the concept of transformation that build the political and socio-economic framework in which the implementation of the TNP is embedded.

4.1 Perception of sustainability

4.1.1 The concept of sustainable development

Different approaches of sustainable development

In 1987 the World Commission on Environment and Development, chaired by the Norwegian Prime Minister Gro Harlem Brundtland, publicised the approach of sustainable development in the report 'Our Common Future'. This report significantly influenced the international debate about development and environment¹. The Brundtland Commission perceived sustainability as "a development that corresponds to the needs of today's generations without endangering the options of future generations to satisfy their own needs and to chose their own lifestyle" (Hurni et al., 1998, p. 96). Accordingly, sustainable development has to allow effective ecological, economic, and socio-cultural interests within an integrated development.

This characterisation of the term 'sustainability' by the Brundtland Commission proved to be very general. In the following years a huge number of different approaches of sustainable development arose, many of them using the term inadequately and in a different context and thus the term became an empty phrase. This problem was addressed by Wiesmann (1995) taking an approach towards sustainable use of natural resources *within* the context of regional development. This approach is briefly outlined on page 47.

¹The original concept of sustainability actually stems from the forestry where it has already been in use for many years. The term 'sustainable development' takes up this original concept but expand its scope to a much broader level.

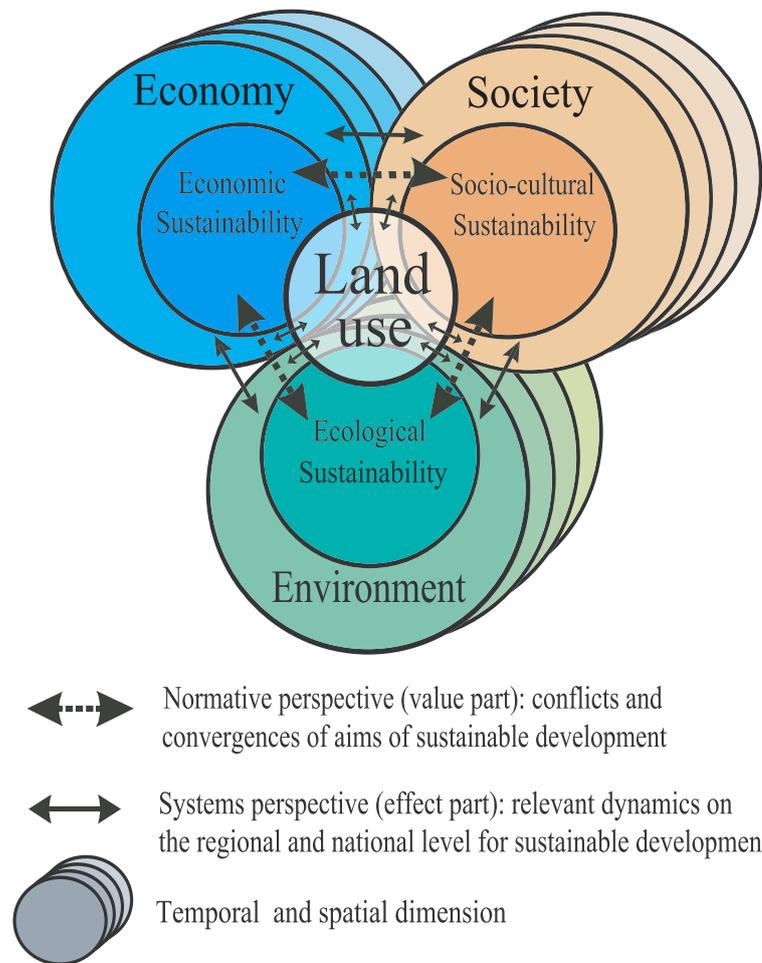


Figure 4.1: Normative and systems perspective of sustainable development with respect to the temporal and spatial dimensions. Each of the three main components of sustainable development include other dimensions of valuation about which the consensus is small. The land use system builds the initial focus point of effects to evaluate the sustainability of the use of resources. It is thus situated in between the three spheres of economy, society and ecology. Since the land use system is embedded in a dynamic socio-economic and socio-cultural system, the use of natural resources is subject to a temporal and spatial dynamic. From this it follows that there is not one option of sustainable development but that different interests and options within the three spheres have to be negotiated at a specified time within a certain regional context (modified according to Wiesmann, 1995, p. 8).

The three dimensions of sustainable development

According to Wiesmann, sustainability can only be assessed within a precise problem context (1995, p. 4). Sustainability is recognised as a normative concept and is thus connected with valuation that depends on the socio-cultural setting. These so-called required values have to be specified within the society and can not be derived from actual values but have to be negotiated among the different stakeholder categories on the local level. From this it follows that sustainability only gets a sense in combination with the political-social valuation of a defined issue. Sustainability refers to long term conservation of values. The degree of sustainability is thereby assessed by a relationship of the change with a social negotiated reference value (required value) (Wiesmann, 1995, p. 7). The normative perspective of sustainable development is hardly ascertainable, thus the term sustainability often stays as an imprecisely defined concept. Generally, the normative perspective focuses on

the three spheres society, economy, and politics. These components of sustainable development and their values and effects on each other are shown in figure 4.1. The three dimensions of sustainability may be assessed independent from each other, the effects however are not independent. Therefore changes in one dimension cause changes within the other dimensions. These changes don't have to be parallel. Wiesmann points out that especially positive changes in the economic dimension often lead to negative changes in the ecological dimension (1995, p. 10). This means that sustainable development is conflicting so that the changes in one sphere have to be balanced with the changes in the other spheres. This appreciation of values implicate a political-social process to find a consensus (Wiesmann, 1995, p. 10).

The disposition of the land use system within the environment

As outlined in chapter 2, the focus of this work is set on the interaction between actor categories with landscape ecosystems inside the TNP. Many of these interactions are affected by the land use system which is situated in between the three spheres of economy, society and ecology (cf. figure 4.1). The land use system focuses on consumptive elements such as the use of natural resources. However, it is also made up of non-productive elements like the conservation of nature and natural resources. As illustrated in figure 4.2, the consumptive use of resources is not compatible with strict nature conservation. Only when the two types of land use (use and conservation) are understood in a less strict manner they may be integrated within sustainable use of resources².

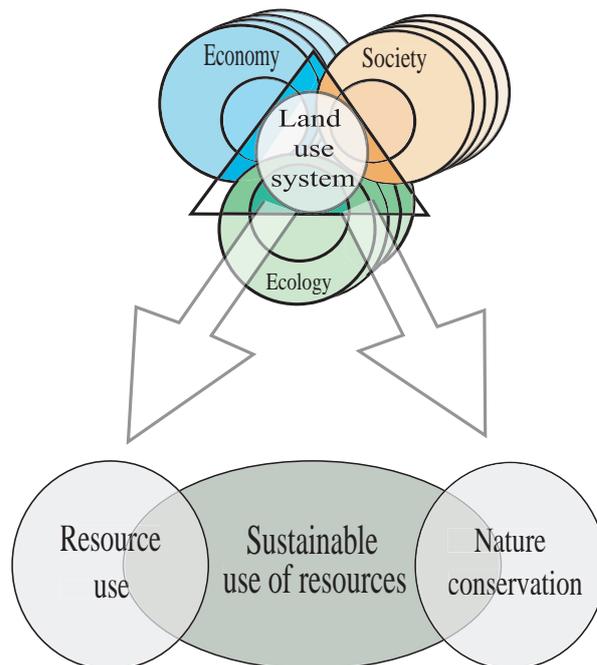


Figure 4.2: The land use system as outlined in figure 4.1 contains all human activities related to the use and the conservation of natural resources. Resource use and strict nature conservation are not fully congruent, but can be integrated according to concept of sustainability (own illustration).

4.1.2 The relevance of sustainable mountain development

Mountain regions take in a special position within the discussion of sustainable development. They are commonly defined in physical terms, but not only with reference

²For a definition of the terms 'conservation' and 'ecological sustainability' see pages 40 and 47.

to high altitude. Additional characteristics include morphology and climate, latitude, biodiversity, land use opportunities, food security, conflicts and cooperation, and highland-lowland interactions (FAO 2000 in: Kohler et al., 2001, p. 6).

Mountains are a source of a variety of natural resources, such as fresh water, biological diversity, minerals and forest. They are rich storehouses of crop and livestock varieties which have been locally developed and maintained and which are now a vital world resource (Poore, 1992). Furthermore, mountains often harbour a great cultural diversity. However, mountains are not only characterised by rich diversity but also by high-energy environments and dynamic landscapes. The fragility of ecosystems is often increased by human activities, namely by the use of natural resources.

These characteristics within the ecological sphere lead to constrictions and options for development, that both are strongly correlated with the surrounding lowlands. Since mountain as well as many lowland inhabitants are dependent on mountain resources, sustainable mountain development is strongly influenced by the management of its resources (Kohler et al., 2001, p. 7). To conserve the rich mountain biodiversity, many mountain areas have been put under protection. However, a strict conservation of natural resources stands in contradiction with all other forms of use by mountain populations. In the social sphere, "sustainable development calls for equity among mountain peoples as well as between them and the inhabitant of lowland areas" (Kohler et al., 2001, p. 7). Economically, sustainable mountain development asks to overcome the imbalance between rural mountain people and urban population.

With respect to these challenges, sustainable mountain development has to focus on the use of the natural potential and at the same time increase economic integration among mountain populations without damaging fragile mountain ecosystems. This may best be achieved with a multi-functional approach of management natural and human resources in all three spheres of sustainability (SDC, 2001, p. 7-8).

4.2 Concepts of ecosystems and their constituents

4.2.1 Landscape ecosystems

Landscape ecosystems are understood as spatial structures including the geosphere, biosphere and anthroposphere that interact with each other. The provision for the anthroposphere forms an enlargement of the ecosystem concept that often only includes the bio- and the geosphere. (Pirot et al., 2000, p. 9 and Naveh and Liebermann, 1990, p. 21). Depending on the point of view, ecosystems are defined as natural or cultural ecosystems (Leser, 1997a, p. 450). IUCN classifies the conditions of ecosystems as

- natural: ecosystems with low human impact,
- modified: human impact is greater than that of other species, but whose structural components are not cultivated,
- cultivated: structural components are cultivated,
- built: ecosystems dominated by human structures such as buildings, roads and mines,
- degraded: ecosystems whose diversity, productivity and habitability have been or are substantially reduced (IUCN et al., 1991, p. 34).

Landscape ecosystems are dynamic spatial units that change as soon as the response structure changes due to natural, technical and political reasons. From this

it follows that biodiversity and geodiversity are only partial models of the superior model of landscape diversity (Leser, 1997b, p. 164). Depending on the inspection, landscape ecosystems occur on different scales, ranging from the topological to the spherical scale (Leser, 1997b, p. 141). Despite these man-made consideration, landscape ecosystems are not closed systems but interact with the surrounding systems and with the smaller ecosystem components (Pirrot et al., 2000, p. 9).

Since landscape ecosystems are embedded in different spheres, they are not only researched by natural sciences, but also by humanities, social sciences and economics. The elaboration of inter- and transdisciplinary approaches within these sciences are recognised as important for the comprehension of the coherences and for the conversion of research findings. However, nowadays inter- and transdisciplinary approaches of landscape ecology are only at the very beginning (Kaufmann-Hayoz and Di Giulio, 1996).

One approach that focuses on a transdisciplinary analysis of human interactions with landscape ecosystems as its natural environment is the Total Human Ecosystem concept. This concept bases on a boxes-within-boxes philosophy including the geo-, bio-, and technosphere in which the subjects of an ecosystem are integrated on nine different levels, representing different scales. Any one of the nine wholes, that range from the molecular level to the human ecosystem level, is but a part of the next larger whole. It is itself composed of parts which themselves are smaller wholes. The last level of this hierarchic system is built by the human ecosystem and has been defined by Eglar as follows: "By human ecosystems, we certainly do not mean a virgin, climax, primeval wilderness, which man has utilised, exploited, raped or ruined and which would return to its 'balance of nature' if only man would 'preserve' it. This is the archaic view of those scientists who are pegged at the Eighth (Ecosystem) Level, and have hit their intellectual ceiling. On the contrary, the idea of the Total Human Ecosystem (THE) is that man-and-his-total-environment form one single whole in nature that can be, should be and will be studied in its totality" (Eglar 1970, p. 126 in: Naveh and Liebermann, 1990, p. 74). From this it follows that landscape ecology is depicted as an integrative science and as a branch of THE science, bridging bio-ecology and human ecology and dealing with Eglar's eight and ninth integration levels of ecosystems and human ecosystems. The goal of the concept is to complement this spatial integration of the bio-techno-geosphere by their functional and structural integration. The conceptual framework of the landscape ecology as understood within the THE approach has been an important contribution to the MAB programme (Naveh and Liebermann, 1990, pp. 68–99).

4.2.2 Natural resources

Natural resources build the base for all life forms. They include all natural raw materials such as mineral resources, natural forests and other vegetation, water and soil. Natural resources are divided into resources that can renew themselves or be renewed at a constant level, and non-renewable resources whose consumption necessarily involves their depletion (Kläy et al., 1992).

Natural resources have specified values within the society. These values derive from the different functions that are associated with natural resources. According to Kohler (2000), natural resources in mountain areas take in three basic functions³:

- function of production: products such as timber and meat,
- function of protection: conservation of biodiversity, protection from natural hazards, regulation of ecosystems,

³Even though Kohler refers to the functions of mountain forests, they may be assessed as similar for other natural resources.

- function of culture and social welfare: protection of cultural and spiritual values, recreation, education and creation of awareness (2000, p. 31).

A precondition for sustainable use of natural resources is the maintenance of the regeneration process. With increasing use and an intensification of the use of natural potentials the risk of degradation of resources or of the whole landscape ecosystem emerges. This risk is especially present when the use of resources undergoes a change in a way that limited factors of landscape ecosystems are further stressed. Changes in the use of resources may also influence their availability for the society in a way that the pressure on marginal sites are increased and conflicts about resources are promoted. Furthermore they may cause processes of concentration in terms of space and property. Additional risks arise when the changes in the use of resources are insufficiently adjusted to local socio-cultural conditions and interests (Kläy et al., 1992).

4.2.3 Biodiversity

The issue of biodiversity gained global attention in the 1980s and especially political recognition at the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro (1992), culminating in the Convention on Biological Diversity (CBD).

Biodiversity is assessed as structural diversity of ecologic systems. According to the CBD, "biological diversity means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems" (CBD and UNEP, 2003a, Article 2).

Biodiversity may be measured as *alpha* diversity, which refers to the diversity within habitats, *beta* diversity, referring to the diversity between habitats, and *gamma* diversity, described as landscape or ecosystem diversity. In defining these biodiversity measures, one must consider their scale. In habitat patches for example, larger areas increase *alpha* diversity, while greater numbers of patches increase *beta* and *gamma* diversity (Pimm and Gittleman, 1992 in: Senanayake, 1994, p. 373). High mountain areas are characterised by a high number of *beta* and *gamma* diversity but a low number of *alpha* diversity. This is mainly caused by the varying relief and high-energy ecosystems. Generally, biodiversity declines above the forest line due to harsh living conditions. Fewer species mean advanced sensitivity because each single species gets a bigger importance (percentage) when it ceases to exist (Veit, 2002, pp. 78–80).

Mountain areas are significant reservoirs of biodiversity, containing rich assemblages of species and ecosystems. The reasons for this richness are manifold. The isolated nature of many mountain ranges has led to the development of a high degree of local endemism. Mountains contain many different rocks, parent material and soils. Due to the vertical spread, mountains are very dynamic and unstable, thus many different succession stages of vegetation are present. Because of the small scale pattern of variability in physical conditions - temperature, radiation, moisture, wind exposure, snow cover - many different communities occur in a small compass. Because mountains are often remote, their ecosystems have been less modified by human action than those in more accessible areas (Poore, 1992, pp. 6–7).

Biodiversity is not a static value but very dynamic. Natural biodiversity exists as the product of a long history of interaction between organisms, landscape, and climate. However, also human impact on nature increase biodiversity of so-called anthropogenic ecosystems (cf. figure 4.3). Agro-biodiversity includes all components of biodiversity which are relevant for agriculture, such as genetic resources of livestock and plants which are used for agricultural production and their wild

relatives; ecological services of agro-biodiversity such as maintenance of soil fertility, regulation of pests, prevention of erosion and binding of carbon. Furthermore it includes abiotic factors which influence the above mentioned aspects as well as socio-economic and cultural dimensions such as traditional knowledge about nature resources and eco-tourism. Especially within agricultural systems, interactions between men and nature created high measures of biodiversity that may be correlated with environmental stability. A rapid loss in agro-biodiversity, therefore, would suggest a loss in ecological stability (Environment & Natural Resources Group et al., 1992).

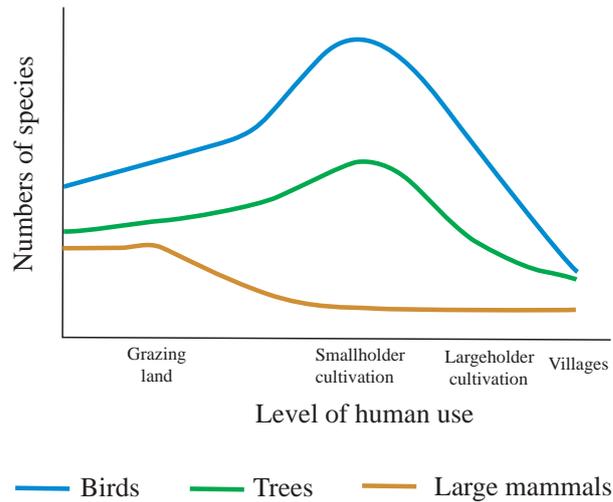


Figure 4.3: Changes in biodiversity as human use intensifies. Except with large mammals, the number of species increases up to a certain level of human use (according to De Haan et al., 2003).

In recent years, much of the mountains biodiversity got lost. Not only direct human intervention but also mechanisms that take place outside mountain areas foster a loss of biodiversity. The main mechanisms that contribute to a loss in biodiversity are environmental pollution (pollution of land, air and water, land degradation), conversion of semi-natural habitats (industrial agriculture and forestry, habitat loss or fragmentation, introduction of exotic species) and over-exploitation of natural resources (Kläy et al., 2001, pp. 4–5). According to the Global Biodiversity Strategy, global climate change and natural disasters have to be added as additional reason for the loss in biodiversity (IUCN, UNEP, WRI, 1992 in: Senanayake, 1994, p. 372). Furthermore, loss of biodiversity results when policies and development activities fail to properly value natural resources and environments. Inequity in ownership and access to natural resources also contribute to unsustainable use of biodiversity (Poore, 1992).

Biodiversity of dryland ecosystems, which are characteristic for many parts of the Pamir Mountains, is mainly under pressure due to grazing impact through trampling and removal of biomass, alteration of species composition through selective consumption and changed inter-plant competition. Undergrazing and overgrazing can both have negative effects, but overgrazing by livestock is increasingly problematic on dryland ecosystems. Other direct negative impacts on components of dryland biodiversity include excessive collection of fuel wood, over-harvesting of plants and over-hunting of wildlife (CBD, 2003).

Unlike the term natural resources, biodiversity in general lacks an economic value. However, to implement policy relating to biodiversity at the level of land management, there is a need for some measures or indicators upon which to base decisions (Senanayake, 1994, p. 373). Due to an incomplete scientific knowledge

and understanding of biodiversity⁴, especially with respect to ecosystem functions and processes, indicators of biodiversity are mostly assigned to components of biodiversity within other themes, such as land, marine and freshwater. The IUCN Species Programme (Mainka, 2001) bases biodiversity indicators on the Red Lists and the Species Information Service. These indicators include the status of biodiversity (the extent to which biodiversity is threatened with extinction); biodiversity knowledge (the extent to which species information is sufficient to determine Red List status); and biodiversity trends (whether species are declining, increasing, or stable). In addition the United Nations Commission on Sustainable Development (CSD) recommends as indicators of biodiversity measures about the area of selected key ecosystems, the abundance of selected key species, and the protected areas as percent of total area (UN, 2003). However, within this thesis these indicators are estimated as too general and not adequate. The valuation of ecosystems and species in key habitats and life forms mainly takes into consideration economic values and disregards ethical values. The percent of total area protected within selected areas does not state anything about the protected biodiversity. Although evidence for the relative numbers of species is elusive, there is likely to be far more biodiversity in areas of land use than in all protected areas together, principally because areas that are used are not only far greater than those protected, but also are the more fertile and naturally biodiverse (Kaihura et al., 2003). A high mountain area of rocks and glaciers and few animal species may thus give a high percentage of protected area within a country, but does not contribute much to the conservation of biodiversity within forests and marshes. McNeely et al. propose another approach for the evaluation of biological resources. They suggest to classify biodiversity into direct and indirect values. Direct values include consumptive use values (non-market value of firewood, game, etc.) and productive use values (commercial value of timber, fish, etc.). Indirect values comprise non-consumptive use values (scientific value), option values (value of maintaining options available for the future), and existence values (values of ethical feeling of existence of wildlife) (McNeely et al., 1994, p. 150). On the other hand, Senanayake outlines that such systems of classification place an indirect value on what is functionally the higher value of biodiversity. He stresses a need to identify values gained from the conservation of biodiversity itself, as opposed to the value of its component parts, so that the value of biodiversity as an operational system may be seen as the primary value, while the value of its component parts are seen as the secondary value. Some primary values that may be considered are increases of ecological stability (sustainability), increase in efficiency of natural cycles (carbon, nitrogen, water), and increase in crop and economic diversity (Senanayake, 1994, p. 374).

4.3 The ecological sphere of sustainable development

4.3.1 Concepts of resource use in the Pamirs

This subsection gives an overview about selected approaches of management of natural resources that are rated as typical for the area within the TNP.

Common property resources

The use and management of natural resources are influenced by the property and usage rights. Since natural resources within Tajikistan are not object of private

⁴Despite the human dimension of biodiversity, it has been mostly studied from the natural scientific perspective within disciplinary approaches. Transdisciplinary approaches are still marginally applied (Kläy et al., 2001; Kaufmann-Hayoz and Di Giulio, 1996, p. 7). Disciplinary approaches of single sciences may contribute to a better understanding of some facts of biodiversity but their findings are often not realizable.

property, a brief outline about the concept of common property resources is given here.

In his article 'The tragedy of the commons' Hardin (1968) aims to demonstrate that resources considered to be common property (those which are not privately appropriated) are doomed to overuse and eventual destruction, given the pressure and demands from growing populations. He points out that everyone has an interest in exploiting that which does not belong to anyone in particular, such as grazing lands, fish stocks, etc. The sum of these individual actions results in a collective process which finally degrades and destroys the common natural resources, since it is in no-one's individual interest to hold back (Hardin, 1968 in: Leonard and Bottom, 2000, p. 16). Today it is accepted that what Hardin terms 'the commons' are in fact 'free or open access resources' which are no subject to management or 'property' rights at all.

In contrast to open access resources, common property resources are governed by institutions who claim ownership and management rights on behalf of a group over the resources in question. These rights include, in particular, the right to deny access to those who do not belong to the community, and to regulate the exploitation of the resource by members (Bromley and Cernea, 1989 in: Leonard and Bottom, 2000, p. 17).

Following these ideas the question arose if sustainability of resource management is dependent on a particular property structure. Mathieu stresses that sustainable resource management is rather dependent on the establishment of a well-specified property rights regime and on ensuring the congruence of the regime with its ecological and social context. From this it follows that the problems associated with the management of grazing lands are not the result of inadequacies with collective management per se, but a failure by the state to recognise the legitimacy of local management institutions (Mathieu, 1991 in: Leonard and Bottom, 2000, p. 17).

Mobile pastoralism

The main form of resource use within the TNP may be described by mobile pastoralism. The following remarks do not discuss the terms nomadism, semi-nomadism, and transhumance, but characterise the general features of mobile pasture use of the Pamirs.

Mobile pastoralism is conducted in regions which usually are not suited for other forms of land use, due to low or erratic precipitation and high altitude or latitude. This form of land use is thus a highly evolved ecological response to seasonally scarce natural resources within fragile ecosystems. Nowadays mobile pastoralism is under pressure in many areas of the world due to various factors which include new borders, pasture degradation, hostile market mechanisms and difficulties of marketing the products, exploration of natural resources, nature reserves, and lack of infrastructure. Sedentarised mobile pastoralism may cause overgrazing around water holes and settled areas which changes the composition of the pasture and is reflected in a decline in the quality of livestock (NGO Forum for Food Sovereignty, 2002).

Mobile pastoralism in the Pamirs slightly varies between the eastern and western parts. It may be characterised as seasonal movement of herders with (Eastern Pamirs) or without (Western Pamirs) their families in a vertical direction to relatively fixed areas (valleys) used as pastures for livestock breeding. Livestock is always out on the pastures (Eastern Pamirs) or stays in stables during winter (Western Pamirs). Extensive grazing is only complemented by small amounts of hay in winter. Herders and their families live in mobile dwellings such as tents and yurts or fix huts on the pastures. In winter they live in houses. Mobile pastoralism is conducted on its own (Eastern Pamirs) or in combination with other activities, mainly with

agriculture (Western Pamirs). Mobile pastoralism in the Eastern Pamirs is thus not only a type of resource use but also a way of life, characterised by different cultural features (Scholz, 1999).

The term mobility refers to several conditions, such as the different areas used during different seasons (winter, summer, fall/spring). Pastures are sometimes switched or alternated from year to year. Summer and fall/spring pastures are in general chosen free and are not demarcated by fences.

Mobile pastoralism constitutes a link between specific agro-ecosystems (hayfields and winter pastures) with ecosystems that are not only used by domestic animals but also by wildlife (summer pastures). This combination builds a base for an area-wide management of certain resources and makes up a potential to use the synergies of sustainable land management and ecosystem management (see below).

4.3.2 Scope of nature conservation

In the following subsection different concepts and instruments of nature conservation are outlined. The concepts are allocated to two different approaches: The strategy of segregation focuses on a spatial separation of protected and productive areas. Within the strategy of integration areas used and those protected build an entity.

Conservation as illustrated in figure 4.2 is understood two different ways. Strict nature conservation is an action for "securing something for a particular purpose" (IUCN et al., 1991, p. 211). The strict management of human use of organism or ecosystems is not compatible with the use of natural resources in an economic manner. Conservation understood in a more general manner, particularly with respect to western approaches, is defined as moderate use of resources that includes protection, maintenance, restoration, and enhancement of populations and ecosystems (IUCN et al., 1991).

The following subsection outlines both directions of nature conservation, while the concepts of sustainability that fully integrate aspects of conservation with economic development are discussed in subsection 4.3.3.

The inconsistency between nature conservation and the use of resources

Nature conservation emerged as a reaction to the intensification of resource use and the thereby caused environmental problems that affected nature and human population. Instead of trying to adjust the way and intensity of land use to the capacity of nature, a new form of land use - nature conservation - was developed. The historic emergence of nature conservation in the West (Northern America and later Europe) led to a strategy that is characterised by a "weitgehende[n] Akzeptanz einer vermeintlichen Zwangsläufigkeit des Widerspruchs zwischen Mensch und Natur, zwischen Nutzungs- und Schutzinteressen" (Pfadenhauer and Karlstetter, 1996, p. 430). This inconsistency between the use of resources and nature conservation was also accepted in the Soviet Union. Nature conservation, mostly based on legal terms only, was thus confronted with a range of aggravating circumstances that are still present today. Without an economic relevance this form of land use misses an accepted right to exist and is often regarded as an object of luxury. Nobody carries out nature conservation as a productive way of resource use, therefore the demand for it is scarce. This is also expressed in a limited competence of the responsible authorities, caused by a small number of beneficiaries and a small extension of the areas that are supervised by these authorities. Further aggravating factors for an integration of nature conservation with other forms of land use are the facts that nature conservation is always constricting in terms of property and use and that the conservation of biodiversity is separated from the conservation of single resources. The latter is further fortified by the attribution of the conservation of different resources to various authorities (Broggi et al., 1996, pp. 301–302).

In its beginnings, nature conservation focused on the protection of single species that were assessed as outstanding or representative for a certain habitat. This was often addressed with the creation of protected areas. However, these were mostly residual areas that were not used by other (economic) activities. Nature conservation was thus intensified on this selected spots while the remaining area was managed with low respect to nature conservation. Later the environmentalists became aware that nature conservation has to take place on a larger scale and single species can not be regarded in isolation since they interact within a dynamic system. The demand for large scale protected areas increased. Smaller areas were networked to optimise the conservation of whole ecosystems with all their species. Protected areas as a main instrument of nature conservation as well as other segregating strategies are now briefly outlined.

Strategies of segregation

Segregation is a top-down approach to protect certain areas which are therefore spatially separated. This separation of protected ecosystems is assessed as an important short term activity to save space for an undisturbed recovery of biodiversity that may not be achieved in intensely used areas. Segregation bases on the understanding that people constitute a disturbing factor and thus are harmful to their environment. In this sense strategies of segregation are closely linked with strict nature conservation.

According to the CBD, protected areas are geographically defined areas which are designated or regulated and managed to achieve specific conservation objectives. Thereby the management is often guided by a strong legislation supported by a rigorous law enforcement. Objectives of protected areas however do not only focus on the conservation of special features. Generally they focus on preserving biodiversity, maintaining life-supporting systems, and protecting natural as well as cultural heritage (IUCN et al., 1991). Within protected areas the conservation of whole ecosystems is superior to the conservation of single elements (ABN, 1985, p. 66). Furthermore, protected areas aim at an *in situ* conservation of species in their natural habitats⁵. This conservation is assessed as important especially for wild relatives of domesticated animals and crop plants, as base to improve established crops and develop new ones.

Protected areas can provide opportunities for rural development and rational use of marginal lands. They can generate income and create jobs, may be used for research and monitoring, for conservation education, and for recreation and tourism (IUCN et al., 1991). Despite these opportunities, many protected areas have to be assessed as delicate in terms of their relationship to resident people. From a natural science point of view, man is often regarded as disturbing factor for nature and thus frequently excluded from protected areas. This may cause an intensification of the use of resources outside the protected areas and thus lead to an increase of the pressure on the protected areas. Protected areas that are planned in a top-down approach, excluding resident people from both participation in planning and obtaining benefits, may cause a low acceptance of the protected area by the concerned people (Kläy et al., 2001, pp. 9–10).

Worldwide a huge number of categories for protected areas are existing. In the following, the focus is directed to the category of national parks. In addition, two instruments of protected areas are outlined.

National parks: National parks are defined as "protected areas managed mainly for ecosystem protection and recreation" and included into category II of

⁵ *Ex situ* conservation maintain populations of animals and plants within zoological and botanical gardens, mostly located outside the natural habitat of these species.

IUCN's protected area categories (IUCN et al., 1991). National parks are "natural areas of land and/or sea designated to protect the ecological integrity of one or more ecosystems for present and future generations. They exclude exploitation or occupation inimical to the purposes of designation of the areas, and provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities; all of which must be environmentally and culturally compatible" (IUCN et al., 1994, p. 19). According to IUCN, national parks aim primarily at conservation, while the sustainable use is included only secondarily. Therefore, economic use such as grazing, forestry, mining, hunting etc. are not allowed within national parks (Alliance for Nature, 1990, p. 12).

Even though IUCN presents, with the classification of protected areas, a framework for an international comparison, national terms for national parks (as well as other IUCN categories) and their management may vary. The Soviet perception of this category focused more on the recreational aspect while scientific activities were assigned to the *zapovedniky* and *zakazniky* (see chapter 6).

According to IUCN, national parks have to fulfil several criteria. A national park covers an area of at least 10 km^2 to prevent one or several natural ecosystems from changes in use and settlement. Thereby the focus is set on the long term. The splitting of the park area into different zones facilitates to implement different goals, reaching from strict conservation to recreation. To guarantee conservation, measures in maintenance, designing and administration are necessary. These are supervised by the topmost state body. Sufficient staff and finances are important for the efficiency of the national park. Last but not least a national park has to serve as a recreational area. Therefore it has to give open access and provide certain facilities to the public (ABN, 1985).

National parks are often selected according to the hotspot concept. Hotspots are regions that harbour a great diversity of endemic species and at the same time have been significantly altered by human activities. The plant diversity forms the basis for the hotspot designation. According to Williams (1998), hotspot areas are selected by methods of gap analysis and the definition of complementary areas. A similar concept is the definition of key species and key areas. This bases on a valuation of constituents of ecosystems into 'important' and 'not important' and is regarded as very problematic within this thesis since not only popular ecosystems and species deserve conservation. Furthermore, even if protected areas are selected on the basis of their biodiversity value, a major portion of the world's biodiversity will not be included in these areas since it is located within the production landscape.

In addition to the selection of single species, the approach of cross linking seeks to link as much of the biodiversity as possible. Therefore a high number of small protected areas, of which each represents one feature, is linked with each other to guarantee that many different features are protected. From this it follows that within a few large protected areas that cover similar ecosystems, only a small amount of different features may be protected (Dobson, 1996, 211).

Protected areas may be managed as transnational protected areas between different states, as national protected areas linked to international or national legislation. They may also be managed privately, by a community or a NGO (Dudley and Stolton, 2003).

Zoning: The term 'zoning' stands for the process of demarcation of areas according to certain criteria. Concepts of zoning are manifold and discussed not only in relation with protected areas and nature conservation, but as a general instrument of spatial planning.

Zoning of a certain area may be necessary for the realisation of different goals but also because of the character of the landscape (distribution of different ecosystems) or the spatial character (legal relationships). Zoning may serve as an instrument

to balance different interests about the access and use of resources. Therefore the definition of borders and the allocation of functions to these zones should be done within a participatory process (Amend, 2002). A key element of participatory zoning is the definition of the limits of use with respect to the conservation objectives and the traditional use of resources (Thies and Keilbach, 1999, p. 220). This should not be done according to the concept of carrying capacity but may be assessed according to the concept of sustainability as outlined below.

With respect to the planning of protected areas, the instrument of zoning is used to diverge different intensities of conservation and use. Existing areas that are used are spatially separated from areas that should be kept without any consumptive use of resources. Areas where the use of resources is not restricted in any form are not zoned and not included in the protected area. From this it follows that a protected area is made up of different zones that regulate the access to and the use of resources in a more or less restricting manner (Erz, 1985, p. 67). Due to the fact that most protected areas overlay already used space, the zoning of the area is often predetermined and alternatives for spatial separations are missing.

Compensations: Compensations for limitations in the use of resources are hardly applied outside the West, but with respect to the acceptance of protected areas by the people concerned it is briefly outlined here.

Compensations are not only an instrument to pay back income losses caused by hindered access to the use of resources in different forms, they also may be applied for maintenance activities. However, the scope of this instrument is limited since it is spatially concentrated to the protected area and only takes into consideration directly concerned people (Broggi et al., 1996, p. 312). Furthermore, the compensation of environmental services and the creation of economic incentives require an integration of conservation tasks within the economic and political spheres, which is not easy to realise.

Hampicke (1991) points out that the strategy of segregation only has to be understood as a rough guideline that does not prevent the integration of nature conservation within the production. Protected areas should not constitute areas which compensate unsustainable use of resources within other areas (Kläy et al., 2001).

Strategies of integration

An important part of the genetic resources is located within the cultural landscape and thus protection of some separated areas may not conserve biodiversity at large. Strategies of integration focus on the enlargement of protection from natural to cultural landscapes on an extensive area and thus realize the human being as part of the ecosystem. Integration in a broader sense constitutes a dynamic and innovative bottom-up approach to implement conservation of natural resources as a spatially and temporally basic principle of sustainable development.

An overall concept of integration of nature conservation within the cultural landscape is outlined by Pfadenhauer and Karlstetter (1996) and Riedl (1991). They indicate that four parts of integration have to be considered:

- functional integration: realisation of the biotic, abiotic and aesthetic protection of resources.
- spatial integration: nature conservation has to be realised on the total area and should not be restricted to single areas. Genetic interactions as base of evolution need to take place between all species, not only between those protected in a certain area.

- temporal integration: dynamic ecological interrelations have to be considered in the long term.
- socio-economic integration: the concept of sustainable development should be applied to the whole system and not be restricted to the use and protection of resources. Nature conservation is thus not a way of utilisation in addition to others but a spatially and temporally comprehensive basic principle of all ways of utilisation (Riedl, 1991 in: Broggi et al., 1996, p. 307).

Since the integration of nature conservation with the landscape as a whole is strongly dependent on the spheres of society, economy and politics, this strategy has to be assessed as a long term vision that may not be realised in the short term (Broggi et al., 1996, p. 307).

Some concrete instruments of integration are outlined below.

Biosphere reserve: Biosphere reserves, promoted by UNESCO through its Man and the Biosphere (MAB) Programme, are an international label that may be given to areas including existing protected areas. In some cases they are even categorised as one sort of large-scale protected area. However, biosphere reserves differ from the preceding types of sites in that they are not exclusively designated to protect unique areas or important wetlands, but for a range of objectives. Therefore, biosphere reserves are assessed as an instrument of integration within this thesis.

Biosphere reserves aim to fulfil three functions: the function of conservation focuses on the preservation of genetic resources, species, ecosystems and landscapes. The function of development aims at the promotion of a sustainable economic and social development. The logistic function finally focuses on the support of research, monitoring, education and the exchange of information in terms of local, national and global questions about the conservation and development of biodiversity.

Biosphere reserves are made up of three main zones that represent different degrees of protection, respectively use of natural resources. The core area is surrounded by a buffer zone and a flexible transition zone. The core area is strictly protected and any anthropogenic use is prohibited. This area often arises from an already existing protected area. Within the surrounded buffer zone, some activities such as research, education, tourism, and recreation are allowed at specified spots. Traditional land and resource use is finally permitted within the transition zone. The concept of zoning may be handled flexibly, in some cases the core area is split into several locations (UNESCO, 2003). The transition zone constitutes an enlargement of the concept of protected areas with the anthropogenic factor. Man is not separated from protected areas, but considered as an integral part of nature and thus interactions between different ecosystems, natural or man-made, and the human population are taken into consideration to conserve biodiversity as a whole (Kläy et al., 2001, pp. 10–11).

The concept of biosphere reserves constitutes a framework for the single countries. To prevent a top-down procedure that is characteristic for many protected areas, the biosphere concept asks for a participation of local resource users from the very beginning of the planning process. With this approach, long term goals have to be assessed and discussed between different stakeholders. Like this the acceptance of the biosphere reserves should be increased.

Dyer and Holland (1991) address some difficulties of the biosphere concept. They point out that it needs an overhaul because it misses major ecological issues such as temporal- and spatial-scale problems. They propose a new integrated network concept that addresses problems in a more clearly defined manner. To realise this, biosphere reserves should be established as a hierarchical network, each one representing another purpose to guarantee a similar representation of different ecosystems. These should then be linked with transects or corridors to facilitate exchange of different components between these areas over time (Dyer and Holland, 1991).

Ecosystem management: The ecosystem approach, mainly developed parallel to the biosphere approach within the MAB Programme, focuses on the realisation of the Convention on Biological Diversity (CBD)⁶. This approach recognises that people and their social and economic needs are an integral part of the ecosystems. Ecosystem management aims at a combination of conservation and use of natural resources and biodiversity in a way that takes respect to the interests of all stakeholders. This does not mean to realise a multiple-use strategy that may please all, but to investigate in a participatory process during which information and interests are exchanged and discussed among the different stakeholders on all decision-levels (CBD and UNEP, 2003a).

The ecosystem approach may be assessed as an answer to the increasing influence of the globalisation process on the management of ecosystems. This influence confronts any decentralized structures and thus hampers the participation of the resident people concerned (CBD and UNEP, 2003a). The assessment also bases on the awareness that ecological diversity is closely related with cultural diversity. From this it follows that the conservation of biodiversity is dependent on the conservation of the cultures within these ecosystems, its variety and the specific knowledge of its people. Therefore ecological diversity can not be globally defined by scientific concepts that often base on western philosophy but have to take into consideration different cultural conditions⁷.

The ecosystem approach bases on 12 principles that focus on the functional relationships and processes within ecosystems, the fair and equitable access to the benefits derived from the functions of biological diversity in ecosystems and from the use of its components, adaptive management practices such as ongoing participation of all relevant stakeholders, decentralisation and cooperation (UNESCO, 2000, pp. 4–5). From this it follows that success in conservation may not (only) be measured with clear outputs such as the expanse of protected areas and the number of threatened species protected within these areas.

Ecosystem management does not "preclude other management and conservation approaches, such as biosphere reserves and protected areas ... as well as other approaches carried out under existing national policy and legislative frameworks, but could, rather, integrate all these approaches and other methodologies to deal with complex situations" (UNESCO, 2000, p. 3). Ecosystem management has to be adaptive in order to respond to uncertainties resulting from non-linear processes of ecosystems and the incomplete knowledge of their functioning. Furthermore it has to contain elements of 'learning-by-doing' or research feedback (UNESCO, 2000, p. 3). Therefore the scale of ecosystem management has to be assessed from case to case. It should be determined by the problem being addressed and include natural as well as anthropogenic ecosystems (UNESCO, 2000). There is no single way to implement ecosystem management, as it depends on local, regional, national, and international conditions.

The ecosystem approach was mainly developed in North America and later adapted to European strategies of conservation of natural resources. Since this approach is strongly dependent on socio-economic and political positions that vary with respect to the countries of the South and East, the approach may not be implemented the same way all over the world but needs some further specification for different conditions outside the West (Pirot et al., 2000). An important step to avoid opposition from the society is the survey of social institutions and forms of organisation concerning their potential contribution to ecosystem management. For this purpose actual conflicts about resources have to be analysed with respect to institutional conditions and the different cultural perceptions of biodiversity and

⁶The CBD is one of the key agreements adopted at the 1992 Earth Summit in Rio de Janeiro.

⁷This demand is further described by Darrell, 1999 with the so called bio-cultural approach.

development (Hurni et al., 2001).

An animadversion on the approach of ecosystem management bases on the vagueness about the agreement of its aims. Kläy et al. (2001) raise the question if the conservation of biodiversity is predetermined within the ecosystem approach or if it is a part of a social learning process. A possible solution to this problem is the enlargement of the ecosystem approach with the concept of sustainability. This is outlined in the following subsection.

Factors that influence conservation

As described above, conservation mainly focuses on the protection of biodiversity and natural resources. The major causes of biodiversity loss are habitat loss and degradation. These processes constitute threats to sustain biodiversity with conservation. The root causes of biodiversity loss however are found in the socio-economic and political context that motivates local action. "Conservation is inherently political, and the most significant challenges facing conservation efforts are not biological but social and political" (Brandon et al., 1998, p. 2). As a consequence, threats to biodiversity are over-determined, since they have many causes and addressing only one or a few of them will not result in sustainable conservation.

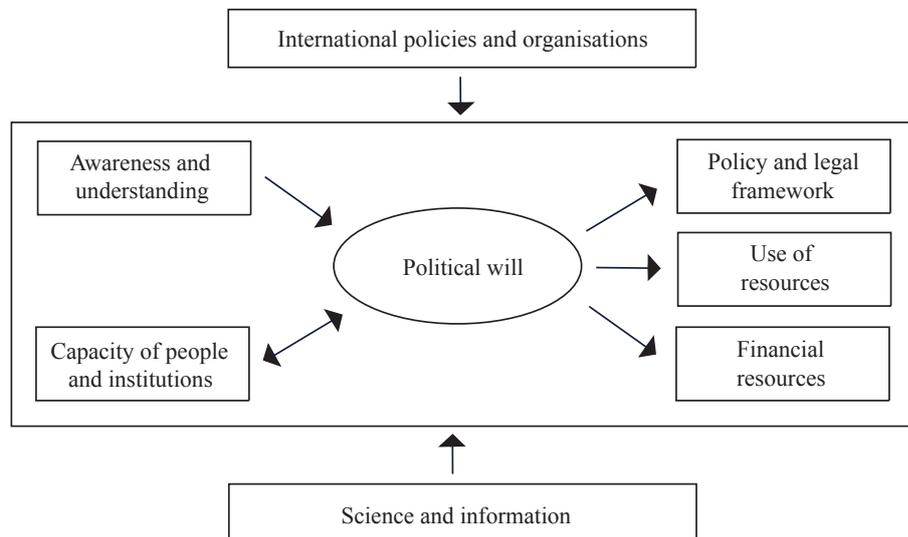


Figure 4.4: Factors that influence sound conservation of biodiversity and natural resources (according to Smith, 2000, p. 12).

Figure 4.4 shows the factors that influence conservation as assessed by Smith and Martin (2000). The central and thus critical ingredient is the political will to conserve biological diversity and natural resources. Political will is essential not only on the national, but also on the international, regional and local levels. Key factors that influence the political will are awareness and understanding of the value of biodiversity and the benefits of its conservation. Capacity of people and institutions are important to influence policy, engender commitment to conservation, effectively channel resources and to carry out actions in the field. Institutional capacity however is also affected by the degree of political will. In addition, three other important ingredients to conservation are largely the product of adequate political will. The policy and legal framework provides incentives for or against conservation. Political will influences the extent to which the value of biodiversity and the services provided by robust, biodiverse ecosystems are real and immediate. This is reflected in markets and, therefore, resource uses. Furthermore, political will is crucial for the adequacy and diversity of financial resources allocated for conservation. Finally, two additional factors impact in these other six in a cross-cutting way. The international context

of policies, commitments, and organisations is a very important determinant of conservation nationally and globally. The availability of scientific data and reliable information is essential to support all of the other ingredients needed to achieve sound conservation (Smith and Martin, 2000, pp. 11–17).

4.3.3 Concepts of sustainable use of resources

Concepts of resource use (cf. subsection 4.3.1) and nature conservation (cf. subsection 4.3.2) are integrated in approaches of sustainable development.

Sustainable use of resources within the regional context

According to Wiesmann (1995, p. 11), the direct or indirect, intended or unintended use of natural resources is crucial for an assessment of the ecological sustainability. The focus on resource-oriented approaches allows an operationalisation of sustainable development (Barkmann, 2001, p. 16). To achieve an ecologically sustainable development, the use of natural resources has to be arranged in a way that the required values on the ecological value part can be conserved. This implies that sustainable use of resources does not have to be restricted, but that alternative forms of resource use are discussed within the society. From this it follows that ecological effects of the use of resources are only addressable in a precise spatial-ecological context and thus measures to improve the sustainability of the use of natural resources have to join with the spatial context (Wiesmann, 1995, p. 11).

The dimension of valuation in the use of natural resources is the potential of nature (Wiesmann, 1995, p. 13). This comprises the totality of those components of nature that are assessed as valuable and useful by a certain society to a specific date. According to Finke, the potential of nature is assessed by a classification of the ecological spatial units with the aim to value these units according to the claims of their use by the society. Synonymical used terms are the ecological function of the landscape and the potential of the landscape budget (Finke, 1994, p. 114). Wiesmann stresses that the potential of nature may differ between different societies. The potential of nature is classified into two components, the general potential of nature and the specific potential of nature. They represent different perceptions ('outside' and 'inside'): the general potential of nature is stamped by the western-industrial view that is mainly represented by the natural sciences. The specific potential of nature bases on the view of the resident people and varies within the spatial context (Wiesmann, 1995, p. 15).

To assess the sustainability of the ecological dimension, resident people as well as representatives of the 'outside' view both have to value the potential of nature within a specific spatial context. According to this approach, the use of natural resources may only be assessed as sustainable, when neither the specific nor the general potential of nature changes to negative values (Wiesmann, 1995, p. 19).

Both potentials of nature contain a variety of different dimensions of valuation. Wiesmann structures them in four types that allow to comprehend the concept of sustainability:

- The output-orientated potential of nature spans all components and characteristics of nature that are valued for the production of products within the specific and general potential of nature
- The physiological-orientated potential of nature contains those components of nature that influence the physical well-being of people and is valued accordingly.
- The socio-cultural potential of nature spans those components of nature that are assigned with a cultural value.

- The ethically justified eigen-value of nature contains the attribution of a right for the existence of nature with all its species (1995, pp. 16-17) .

All these types are included in both dimensions of the potential of nature, however, their weighting and characterisation may differ from each other. The valuation of the potential of nature is only practicable when parts of this potential are selected and analysed. This selection is crucial for the quality of the assessment of sustainability (Wiesmann, 1995, p. 31).

To evaluate the sustainable use of natural resources, Wiesmann stresses an analytical concept that has to be applied within a regional context. Within this concept, the focus on effects is combined with a focus on the dynamic effects in a human-environment system. The land use system of a specific region builds the initial point of focus of effects to evaluate the sustainability of the use of resources. It contains all human activities related to the use of natural resources and other factors that affect the ecological system. Since the land use system is embedded in a dynamic socio-economic and a socio-cultural system as shown in figure 4.1, the use of natural resources is subject to spatial and temporal dynamics. Through the use of resources the land use system encroaches in the ecological sphere and may change its components. Some of these changes are noticed and valued by the resident people and outside experts within the above described potential of nature. As soon as the land use system has negative effects on the ecological sphere in terms of a worsening of the potential of nature, the sustainability of the use of resources is not warranted any more. These changes may cause adaptations of the land use system by its users (Wiesmann, 1995, p. 20–23).

Starting from this concept, the degree of sustainability in the use of resources is assessed using three steps of evaluation: First, a basic valuation of the potential of nature at a specific date has to be done. This valuation serves as reference value for the following assessment of the degree of sustainability. In a second step, a prospective analysis of the ecological effects of the different land uses is done. Finally, the changes in the value of the potentials of nature are assessed. With this step, the noted or expected ecological changes are linked to the reference values whereby the degree of sustainability of the use of natural resources may be assessed (Wiesmann, 1995, p. 29–30).

This concept of Wiesmann meets the weak points of the concept of sustainability of the environment organisations IUCN, UNEP, and WWF (see IUCN et al., 1991). The strategy for sustainable living outlined by these organisations is strongly stamped by a western world view and focuses on the world scale, thus it misconceives that the conditions for a sustainable development are different within each region and may not be defined or changed from an outside approach alone but need the integration of local residents.

Following these remarks, one can subsume that no global concept of sustainability exists. Sustainability does not exist on its own, but only with respect to the dynamics of development. Within the ecological sphere of sustainable development, the use of resources can become more or less sustainable. Thereto the use of resources has to be analysed on a local scale with the participation of resident people and with a consideration of the dynamic aspect.

Sustainable Land Management (SLM)

The concept of Sustainable Land Management arose from older concepts that were in use to assess the capacity of certain environments. For a long time, the concepts of carrying capacity were used for the analysis of resource use to reach a sustained yield. These concepts only focus on the bio-physical parameters with the aim to guarantee the production within the productive areas. However, the management of certain factors of biodiversity alone does not guarantee sustainable development. When

the lack of the socio-economic dimension was recognised in the 1970s, concepts of carrying capacity were replaced by concepts of land capability. However, the capacity of a certain area with the given resources is also influenced by technologies, capital, energy, labour, and knowledge as well as by external natural resources and economic, political and institutional conditions. Yet these concepts are inspired by practices that come from totally different eco-social systems. Western notions of calculated stocking rates are at best only approximations and are hardly realized with respect to dry-land ecosystems which are complex and difficult to predict. According to the NGO Forum for Food Sovereignty, traditional societies do have a notion of these concepts and use them, but they are very different from our mathematical notions. They are based on adaptive management, including continuous feedback loops and flexibility in management (NGO Forum for Food Sovereignty, 2002).

Following this awareness, a new concept of Sustainable Land Use was developed as a system of technologies and/or intended measures with the aim to integrate ecological principles of land use with socio-economic and political principles to achieve intra- and intergenerational equity (Hurni et al., 1998, pp. 96–97). With the inclusion of the socio-economic dimension, the SLM concept reaches a higher complexity as the concept of carrying capacity. This enlargement implicates a higher degree of temporal-spatial dynamic and unpredictability. Like other concepts of sustainability, SLM too is dependent on different perceptions and contains conflicts of interests (Hurni et al., 1998, pp. 96–98).

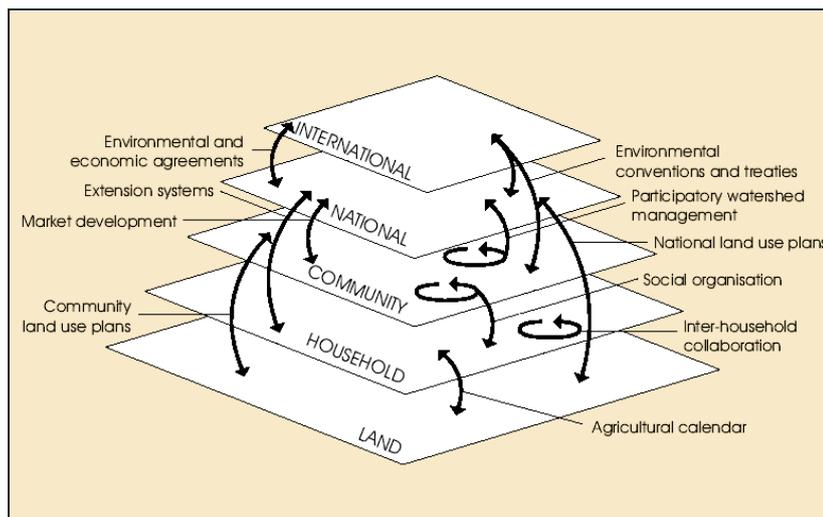


Figure 4.5: Intervention levels and activities in sustainable land management according to the multilevel stakeholder approach (Hurni, 1996, p. 34).

The multilevel stakeholder approach arose from the development of the SLM concept as a method of resolution for complex problems related to the use of resources. A feature of this approach is the inclusion of different categories of interests on the institutional and personal level, from the land users and households on the local level to the communities, regional and state intuitions to the international community. The single categories of stakeholders do not constitute homogenous groups, they may be differentiated according to gender, age, economic status, religious interests, etc. Figure 4.5 shows the different possible relationships between several levels according to the example of sustainable land use.

As soon as one stakeholder category is non-involved in the management of land and resources, a failure of the solution approach is possible. This characteristic may be assigned to all projects dealing with different interests in the management of natural resources. Thus it may be regarded as a leading concept for the assessment of a solution approach for the realisation of the Tajik National Park. Its implemen-

tation may be only realised when stakeholder categories from all intervention levels are included into the process of negotiation.

Horn-Haacke (1999) describes a similar approach focusing on the integration of different stakeholders in the planning process and management of natural resources of protected areas. He points out that with a so called user-oriented management and conservation of natural resources, overexploitation of certain resources within areas where people have few alternatives should be prevented. This is realised by an involvement of all stakeholders in the definition, establishment, and operation of new resource management systems. The stakeholders may be assigned to the groups of users, the regulators, the supporters, or the general public. The activities within this approach comprise five fields:

- **Learning:** creating awareness of problems and alternatives for action and competence in managing resource-related issues among the stakeholders.
- **Participation:** enabling participation in decision-making processes of those who live with the consequences of decisions (or non-decisions) on natural resource use.
- **Motivation:** identifying and offering motivators that trigger change and favour constructive behaviour.
- **Design:** designing and establishing the project 'hardware', in terms of protected area infrastructure, zoning of permitted use of resources, etc. including instructions for operation.
- **Self-organisation:** providing for future self-organisation in the management of the resource-use system by interaction between the different organisations and institutions involved (Horn-Haacke, 1999, pp. 77–83).

It may be concluded that the requests of nature conservation may be combined with the use of resources, provided that conservation is integrated into a sustainable system of resource use. This system has to meet the following requirements:

- include superior spatial units (ecosystems),
- make use of the potential innovations in sustainable farming,
- realize the best possible integration of different perspectives of both internal and external actors with respect to the use of resources and sustainability (Hurni et al., 2001).

4.4 Concepts of transformation

The history of origins of the TNP is not only influenced by numerous concepts of resource management and nature conservation, but also by the Soviet heritage and the process of transformation. The following section gives an overview about leading concepts of transformation and highlights some characteristics of the post-Soviet society which are assessed as important influencing factors for the history but also for the further development of the TNP.

4.4.1 The process of transformation

The enormous changes that took place after the breakdown of the Soviet Union are generally condensed with the concepts of transformation. Thereby the terms of transformation, transition, and change of system are used as synonyms (Cvijanovic, 2002, p. 8). The various aspects of transformation vary according to the different

methodological positions within the different disciplines (Cvijanovic, 2002, p. 8). In general, transformation stands for a process of change of a socialistic system to a system of market economy and democracy with a specific characteristic for each country (König, 2002, p. 16). This process is many-sided and affects the whole social system with its economic, political and legal subsystems.

The process of transformation may only be completed when all spheres of the transformation are changed, such as:

- economic sphere: from the planned to the market economy
- political sphere: from dictatorship to democracy
- behavioural sphere: from dogmatism to relativism
- legal sphere: from the party-ideological legal order to the civil law order (Cvijanovic, 2002).

Each of these four spheres of transformation have to undergo simultaneously severe changes that proceed with different speed and extent and stay in interdependence to each other. Since the changes in these four spheres are still going on today and the civil systems are still full of contradictions, the process of transformation is not completed yet in the CIS (Cvijanovic, 2002, p. 9).

Even if transformation processes of different countries never proceed the same way, some similar effects may be identified in each single case: privatisation, increasing unemployment, inflation, and gap of wages and social levels, ethnic and economic migration, corruption and fundamental changes within the society are some of the most observed effects of a transformation process. With a general increase in poverty and growing social disparities, countries in transition (countries of the East) feature some similar troubles like the developing countries (countries of the South), even though the background and the causes are different (Stadelbauer, 2000).

Despite new attempts to integrate different disciplines in the establishment of a theory of the transformation process in its whole complexity⁸, the approaches still miss the ecological dimension. The basic changes that take part in the economic, political and social spheres also interact with the ecological sphere. The creation of new structures, rules, and codes of behaviour affect the attitude of the people toward ecological matters. Considering as example the restructuring of the agriculture in the course of transformation as described by Herbers (2001), the organisation of land use experienced basic changes in the Pamirs that do not only take place on the economic level but have a deep impact on the handling and management of natural resources.

4.4.2 The Soviet heritage

The process of transformation brought and still brings deep changes in the structures of the social, economic and ecological spheres. Transformation is not a project with a short term goal and its process is not completed with the take-over of structural elements of the market economy (Schrader, 2002, p. 2). Even though Tajikistan is on the way to a market economy, many aspects of the old socialist structure are still present today. Together with the pre-soviet history described in chapter 3 they may be regarded as one part of the history that form the framework for any future development (Schrader, 2002, p. 5).

⁸Particularly neoinstitutionalistic approaches serve as umbrella concepts for a combination of economic and political theories (Segbers, 1998). The cybernetic system theory of König aims to combine different interpretations of the process of transformation with the help of system-oriented considerations on the macro-level and their complementation with approaches of actor - and action theories on the meso- and micro-level (König, 2002).

To be able to assess the establishment of the TNP and the thereby provoked reactions of different stakeholders within the historic setting, some general characteristics of the post socialistic structures are described below.

Political capitalism

During the process of transformation a close linkage between the politics respectively bureaucracy and the economy, represented by the new private companies, emerged. This linkage is referred to as political capitalism by Staniszkis (Schrader, 2002, p. 7). Political capitalism comprises the reproduction of power and dependence and thus differs from the capitalism that is characterized by an accumulation of capital. For this purpose the position in the economy and administration is often abused for personal appropriation and the coverage of the own position by the filling of key positions with 'friends'⁹.

Estranged collectivism

The post socialistic society is stamped by a weakness of an organized representation of interests and an absence of collective action. The inherited attitude toward the collective is described as 'estranged collectivism' by Patzwaldt (2001, p. 16).

During the Soviet era the collective represented the administrative entity on which goods and benefits were distributed. But the employees of a collective farm did not realize this collective in terms of a voluntary organization of individual workers to enforce specific interests nor did they apprehend it as this. Rather they understood the collective as an entity that was forced from above. Since this form of collective was not based on voluntaries it may be conceived as estranged. This estrangement keeps the employees from using the collective as an instrument for the implementation of their common interests until today (Patzwaldt, 2001, p. 17).

This missing collective action may not only be found in the economy, but in all spheres. It can be regarded as a Soviet heritage that may complicate participatory approaches of protected areas planning since local people are not used to agree their interests among each other and perform as a collective. Moreover they do not have the trust in this form of cooperation.

The relevance of information

During the Soviet era a free flow of information was eliminated since the political power regarded it as a factor for destabilization. Individuals were forced to exchange information among social networks. Therefore relationships were important to get exclusive and thus valuable information (Patzwaldt, 2001). However, when these single networks are not linked with each other they may force social tensions within a society.

With the retention of information by the state the criteria for decisions on the political and economic level were not comprehensible for the public. Thus the society created a listlessness and passivity that was combined with distrust (Patzwaldt, 2001). Despite this distrust the individual was well aware of its dependency from the state. Until today the public structures are awaited to solve the problems at issue.

⁹This phenomenon is also named 'crony capitalism'.

Chapter 5

Methods and Tools

5.1 Methodology of integrated research approaches

The methods that were applied within this study may be attributed to the methodology of integrated research. Integrated research aims at the enhancement of knowledge by using different methodological approaches, such as the participatory and the multi disciplinary approach (Hurni et al., 2002a, pp. 83–88). Furthermore, integrated approaches are an effort to link theory with practice and to include concerned people as participants in the planning of development.

Below, the two methodological frameworks (Sustainable Development Appraisal (SDA), Syndrome concept) which were forming the base conditions of this work are outlined. Both of them were developed or enhanced by the Centre for Development and Environment (CDE), University of Berne.

5.1.1 Sustainable Development Appraisal (SDA)

SDA is a methodological tool that supports processes of participatory planning from local to regional level and initiates the implementation of activities contributing to sustainable development. Within SDA, baseline data relevant for development is assessed in a participatory process and evaluated to support sustainable resource management and sustainable development from the viewpoint of different actor categories (Hurni et al., 2002a). The SDA further serves as baseline for the monitoring of changes induced by internal development and for impacts of external action in the area (Hurni and Ludi, 2000, p. 17).

The SDA is based on empirical information and data developed for pre-defined area units at different scales. Therefore it is best applied by interdisciplinary teams, following the framework of the SDA as illustrated in table 5.1. The teams work with local and external stakeholders in a transdisciplinary manner. With this combination of external (scientific) knowledge with the indigenous knowledge of local land users, shared views of needs, options and constraints concerning sustainable development are assessed. These shared views serve as base for defining entry points for development activities (Hurni and Ludi, 2000).

A SDA was conducted by the Pamir Strategy Project (PSP) study team in summer 2001 (see Breu and Hurni, 2003). Local Development Profiles have been compiled within an interdisciplinary team (see Degen, 2002; Imbach and Hergarten, 2002).

The final component of the SDA (integration) was realised with a multilevel-multi-stakeholder workshop held in Khorog in October 2003. During this workshop, results of the PSP field campaign were presented, and visions as well as strategies for further development options of the mountain region were discussed among the 80 participants representing all levels from local to international.

Table 5.1: Major steps and elements in a Sustainable Development Appraisal (SDA) (Hurni, 2000, p. 21).

Components		Elements
Preparation	Background and initial steps	
Component I	Participatory assessment and appraisal of current situation	Element 1: Characterisation of spatial units Element 2: Characterisation of actor categories Element 3: Appraisal of interactions
Component II	Participatory assessment and appraisal of dynamics	Element 4: Assessment of bio-physical dynamics Element 5: Assessment of social, economic and cultural dynamics Element 6: Appraisal of change
Component III	Participatory assessment and appraisal of development	Element 7: Assessment of development visions Element 8: Assessment of needs, options and constraints Element 9: Appraisal of development options
Component IV	Preparation of development profiles and synthesis	Element 10: Compilation of Local Development Profiles (LDPs) Element 11: Compilation of Refional Development Profile (RDP) Element 12: Synthesis and recommendations for sustainable devlopment
Integration	Initiation of multi-stakeholder negotiations	

The approach of the SDA demands from researchers to rethink their traditional role in order to make the scientific results comprehensible and available for local people. This implicates that the addressee of the research is not only the scientist, as in basic (disciplinary) research, but also other actor groups, such as the administration on different levels as well as local people concerned by the project of the TNP.

5.1.2 The syndrome concept

The syndrome concept was established by the German Advisory Council on Global Change (WBGU) and focuses on development problems affecting particularly countries of the South, including countries in transition. In this concept, core problems do not occur independently but are closely interrelated and appear in combinations (clusters) that are specific to concrete situations (contexts). Such clusters of problems may be understood as elements of 'syndromes of global change'. A syndrome context always refers to a typical ecological, economic, political and social setting in which a specific syndrome may occur (WBGU, 1996).

Figure 5.1 shows the conceptual framework for the research of syndromes devised for the NCCR North-South (cf. subsection 2.1.2). It is made up of two main components: an analytical component, by which pressures on, states of, and societal responses to core problems and syndromes are analysed. This is illustrated by the upper set of themes that follows the framework of the World Bank and may be characterised as 'reactive chains of enforcement'. The second component supports efforts of individual and institutional actor categories to devise applicable mitigation strategies. This second set represents the assumption that, instead of pressure, change can generate potentials that lead to innovations and emerging opportunities that materialise as new technologies and institutional adaptations. The basic idea is that the system will always have its own dynamics. This situation may be characterised by 'pro-active webs of empowerment' (Hurni, 2000, p. 22).

This thesis may be assigned to the syndrome context of mountainous regions and their interaction with the surrounding lowlands. Mountains of Central Asia are generally characterised by altitudinal stratification, low population density, extensive agriculture and poor infrastructure (see chapter 3). They are dependent on the low-

lands in terms of subsidies (food, infrastructure), whereas they provide the lowlands with natural resources including biodiversity and options for recreation. Due to the common power circumstances the interaction between highlands and lowlands are often difficult. Even though these interactions were not specifically analysed within this study, they have a great influence on the use of resources and the design of the TNP which is mainly determined from the lowland (Dushanbe).

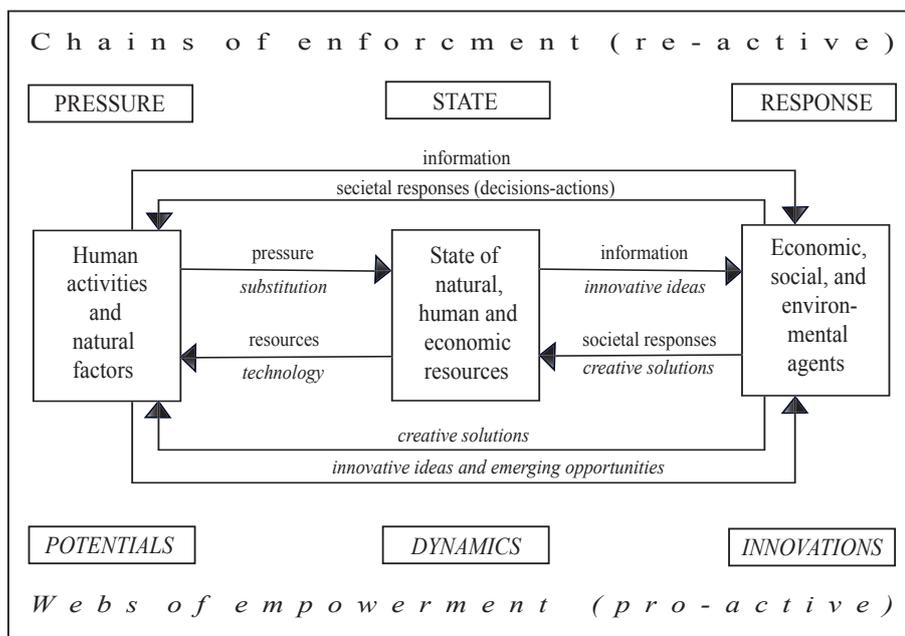


Figure 5.1: The conceptual framework of the syndrome concept developed for the NCCR North-South (Hurni, 2000, p. 21).

5.2 Choice of methods and alternative methods

The main factors decisive for the selection of the applied methods were the duration of the field campaign and the fact that data collection was conducted by one person and not within a multicultural, interdisciplinary team. Due to these reasons, the SDA as described above, could not be conducted as a whole. Nevertheless, the procedure in the field and the data analysis was strongly geared towards some of the components of the SDA.

5.2.1 Qualitative methods

Within this thesis the interaction between different actor categories and the natural environment inside the TNP is analysed with respect to the concept of sustainability. The challenge of the TNP is highlighted on the basis of the perceptions of the people involved in this project and of those affected. This can best be achieved by using a set of qualitative methods and a combination of different approaches, which allow different perspectives on the matter and help to find a solution to questions related to the object of research (Gutscher et al., 1996, pp. 52–55).

Qualitative research features a circular research design as illustrated in figure 5.2. First principles of the process of qualitative research are communication and openness. Communication arises because meanings are investigated by the use of conversation. An openness to a variety of theories, methods, research situations, and

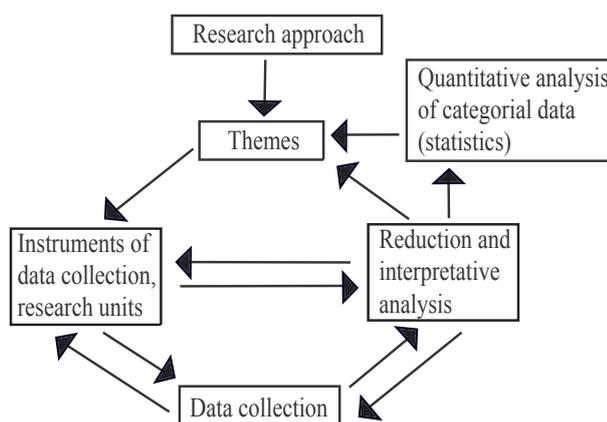


Figure 5.2: The circular process of qualitative research (according to Gutscher et al., 1996, p. 51).

interviewees helps to determine the meanings in context. Specification of theory and methodology is a result of the research process. This is characterised by circular processes during which the single components are specified, revised and modified several times. Qualitative social research does not analyse specific hypothesis related to a research problem but structures the object of research in various themes that are discussed with the persons interviewed. These persons must be given an opportunity to suggest other themes that require investigation; researchers must take such suggestions into account (Gutscher et al., 1996, pp. 54–55).

5.2.2 Alternative methods

To be able to make a detailed comparison between the actual and the target state of a planned or implemented project such as the TNP, a repetitive difference analysis would be adequate. This method bases on a long term monitoring during which inventories about the actual state are assessed. These inventories have to be compared with the participatory negotiated target state in constant intervals. From this comparison, proposals for regulative interventions may be assessed. Within this short term thesis, monitoring in this sense could not be applied as a method.

5.3 Data generation

Data generation in the field took part mainly in summer and autumn 2002. Some additional data stem from a previous field trip arranged within the scope of the Pamir Strategy Project (PSP) in summer 2001.

5.3.1 Location and characterisation of study area

Data collection about the TNP was done inside and outside the park area. Information outside the TNP was acquired from numerous offices located in Dushanbe and Khorog, such as the Nature Protection Committees and the Academy of Science.

Within the huge area of the TNP, three specific study sites were selected. They are illustrated in figure 5.3. As a base knowledge about the study area could already be gained in summer 2001, the selection of one study site could be done in advance (Kokdzhar - Aktash). The other sites were selected in the beginning of the field campaign according to their location and characteristics of resource use and management. Since the base of the field campaign was located in Murgab (Eastern Pamirs), the selected study sites are all located inside the reachability of this

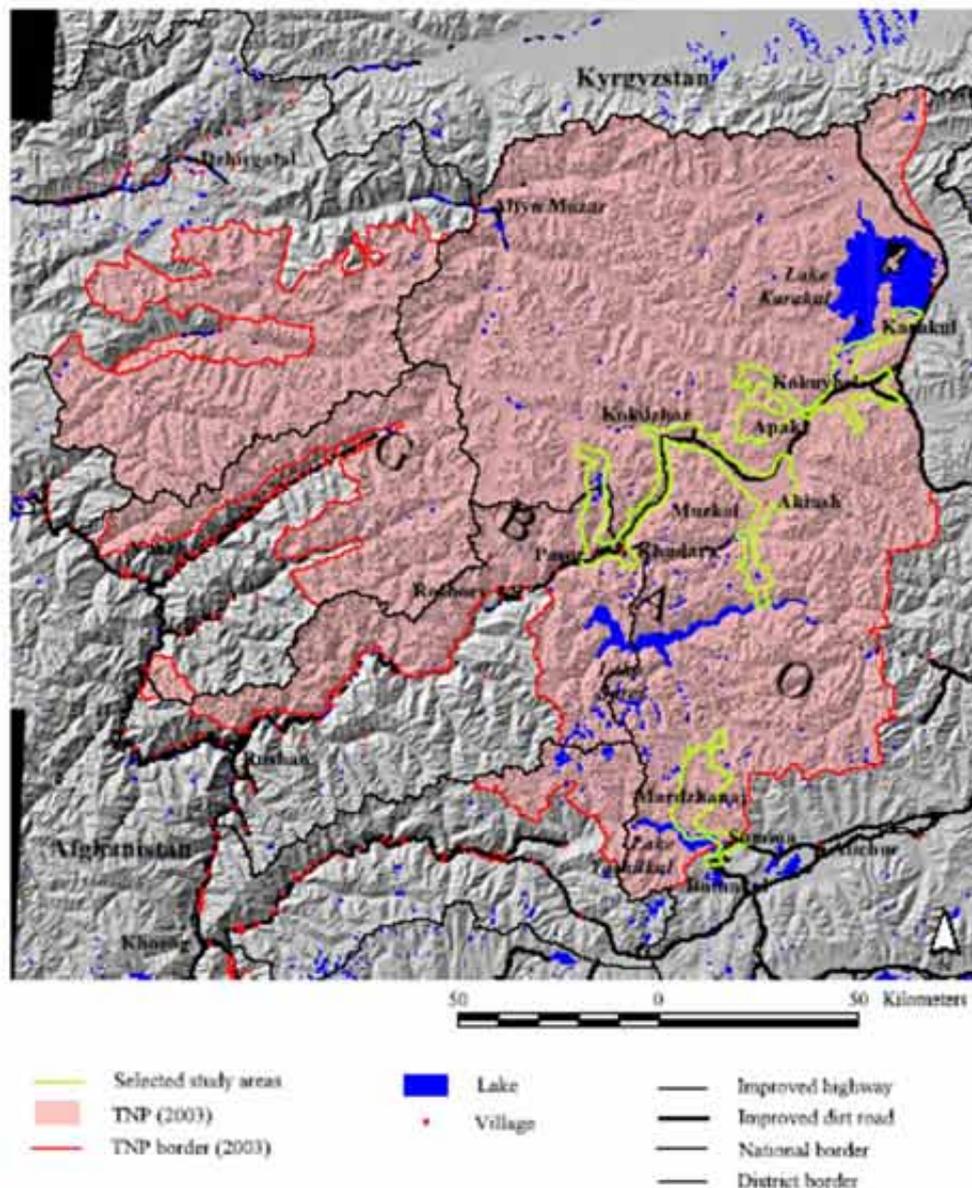


Figure 5.3: Location of the selected study areas inside the TNP (Data source: DTM derived from Russian topographic map series 1:200,000 by CDE; TNP according to TNP, 2003).

village. Areas included into the TNP located outside the GBAO were not visited (north-western part of the TNP). Numerous other sites in and along the park were visited during the field campaign to verify the data acquired in the selected study sites.

The access to the study area was restricted by several aspects, like the size of the TNP, limited infrastructure (roads, car, gasoline), needed permits, interpreters and guides. Most study sites were reached by car, some special locations however could only be reached on foot.

In the following a short overview about the three selected study sites is given.

Kokuybel - Apak (Kokuybel):

This area is entirely situated within the TNP. It comprises the valleys of the rivers that feed the Kokuybel river from the north between the lake Karakul and the Sartoshkol plain (Muzkol area). From east to west these valleys are the Kokuybel, Karadzhim (river Kysilbeles), and Apak. Each of these valleys contain one *jailoo*, except Kokuybel where two *jailoos* are located. The *jailoos* are only inhabited in

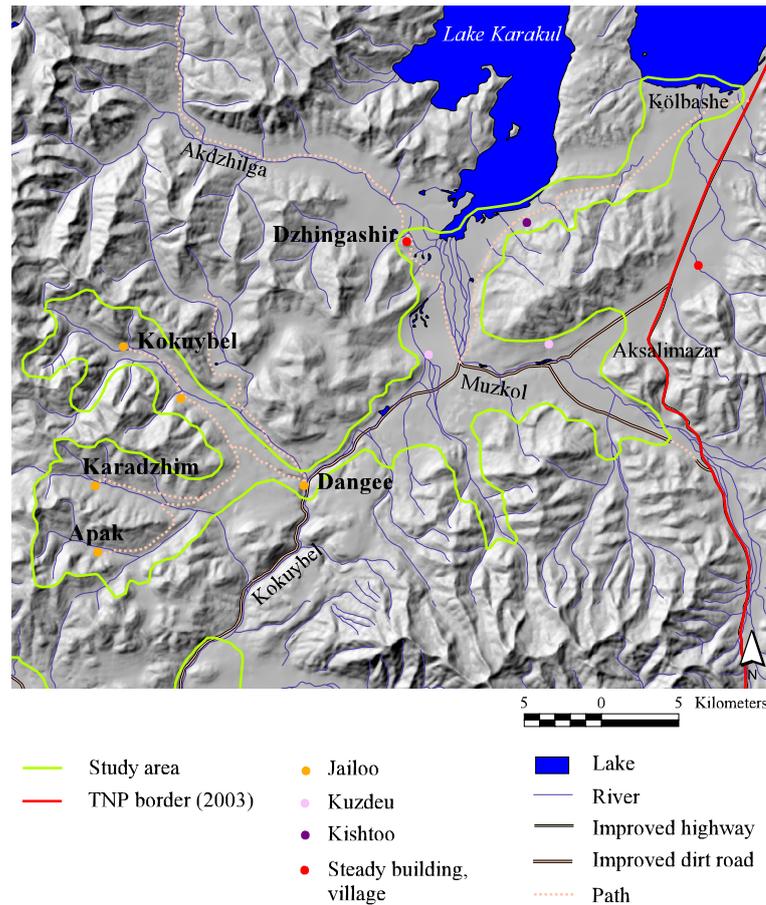


Figure 5.4: Location of the study area south of lake Karakul (Kokuybel - Apak) (Data source: DTM derived from Russian topographic map series 1:200,000 by CDE; TNP according to TNP, 2003).

summer and fall. The winter pastures are located outside the study area, but can also be seen on the map. They are located around the southern shore of lake Karakul.



Figure 5.5: Summer pastures in Karadzhim (Photo: A. Haslinger, August 2002).

Each *jailoo* is inhabited by about three families, however, the number of inhabitants is changing across and within seasons. Especially from mid August to mid September only women, pre-school aged children, old people, and few young men (herders) stay on the high pastures, while the other members of the family either go down to the hay fields to cut the grass, or attend school. The Kyrgyz people living in these valleys built two houses, one in Apak and one in Karadzhim. They are only inhabited in autumn. Most families live in traditional felt yurts. Resident people of this area are all preoccupied with livestock breeding. On the high pastures they are not only looking after their own livestock, but also after that of relative persons.

There is no agriculture within this study site.

Even though every pasture is reachable by car, the study site is assessed as remote. Remoteness is given by the low density of *jailoos* in the valleys, respectively

by the few yurts building one *jailoo*.

A special feature of this area is the proximity to an international hunting camp. The study site is located between the headquarters of the hunting camp south of lake Karakul (Dzhingashir) and its field camp, located in the Beljandkiik valley (west of Karadzhim).

Summa - Mardzhanaj (Yashilkul):

This area is located on the southern border of the TNP (2003) and along the cultural border separating the Pamiri from the Kyrgyz area. It includes the eastern part of lake Yashilkul (Summa) and the valleys north of the lake forming the Mardzhanaj (Kurukdzhangil, Sulek Dzhangar, and across the Mardzhanaj pass the little Mardzhanaj valley).

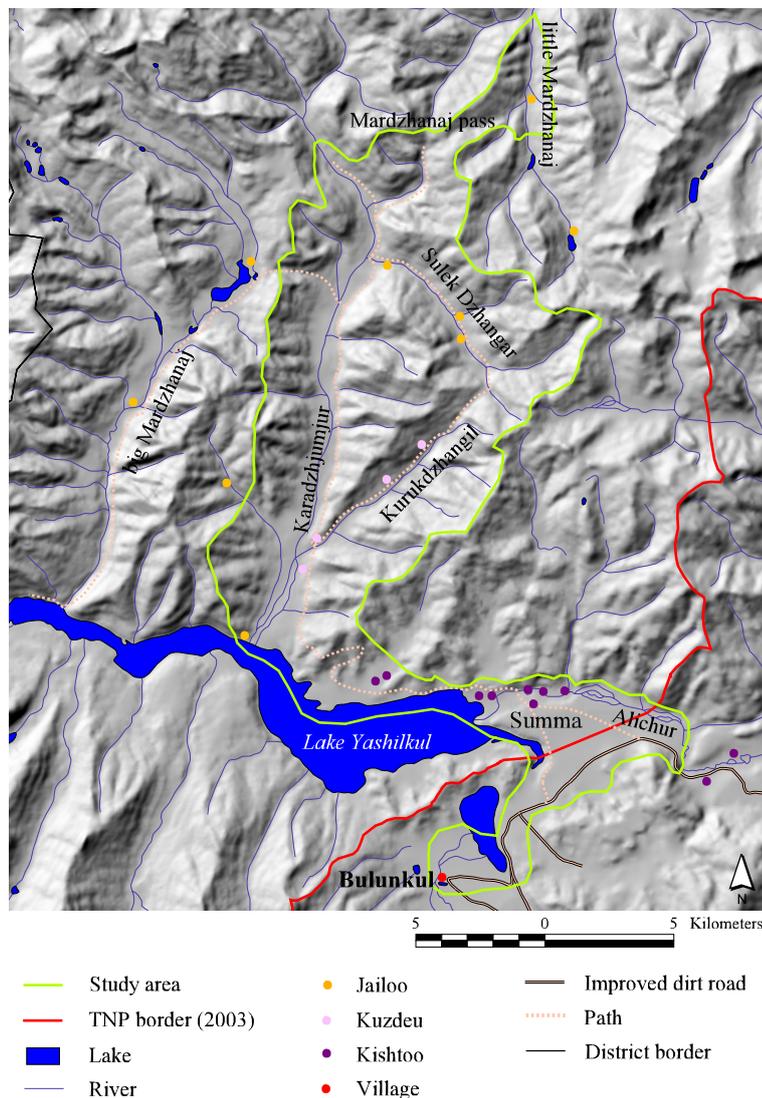


Figure 5.6: Location of the study area east and north of lake Yashilkul (Summa - Mardzhanaj) (Data source: DTM derived from Russian topographic map series 1:200,000 by CDE; TNP according to TNP, 2003).

The area south of the river Alichur is inhabited by Kyrgyz herders only during winter. Their summer pastures are located in another area further in the east and outside the TNP. The area north of the river is inhabited by Pamiri herders from Bulunkul and the Gunt valley (Vankala) and used all year round. The hay fields

along the river Alichur, on the eastern side of lake Yashilkul, are used for mowing and as winter pastures for livestock of both Kyrgyz and Pamiri people. The whole area is managed by state farms and only little livestock is private property. Kyrgyz herders mainly breed livestock from the *gozkhoz* Bulunkul (located in Alichur), Pamiri herders are looking after livestock from the *gozkhoz* Vankala.



Figure 5.7: Hayfield and winter pasture in Summa (Photo: A. Haslinger, September 2002).

Bulunkul is inhabited by 159 (in 2000) Kyrgyz and Pamiri people all year round. All other settlements are only seasonally used. In Summa and in the lower part of the Mardzhanaj several buildings are used in winter. Herders on the high pastures sometimes live in yurts, even though this is not common for Pamiri people. The buildings located in the Karadzhjumjur and Kurukdzhangil serve as accommodation in autumn and spring.

Summa and the lower part of the Mardzhanaj are reachable by car, but the little Mardzhanaj can only be reached on foot via the pass and constitute a very remote pasture.

ture.

Special features of the area are the rich vegetation around the lake and the high number of different species of waterfowl along its shore. At the time of the field campaign construction of an artificial drainage of the Yashilkul was in process on the western end of the lake¹.

Khudara - Kokdzhar - Aktash (Muzkol):



Figure 5.8: Khudara in the upper Bartang valley (Photo: H. Kreuzmann, September 2002).

This study site includes the permanent settled upper Bartang valley around the villages of Pasor, Bopasor and Khudara as well as the pasture areas in Kahavrastara, around Kokdzhar and Dzilgakul. According to the latest border of the TNP the whole area is inside the park, when consulting an older maps, the border of the TNP runs exactly through it (cf. section 7.1).

The villages are inhabited by about 588 Pamiri people². Most people are working as farmers for self-supply. Besides farming, some people are active in the jobs they had during the Soviet era, such as teachers, technicians etc. Around the houses, vegetable gardens are maintained.

Livestock is of own property in this area. Most livestock of one village is guarded by selected herders and not by whole families, since they have to work in the fields during summer. The Pamiri herders in Khavrastara, Kokdzhar and Dzilgakul do not live in yurts. They built huts made of stones covered with branches and cloth.

The villages are located along the main road linking the Bartang valley with Murgab side. They are difficult to reach from both sides, especially during summer when the rivers run high because of melt water. Even though there is a mini hydro

¹This project aims to transform the lake into a storage reservoir for the power station located in Khorog.

²Aktash was built as supply station during Soviet era and is not inhabited anymore.

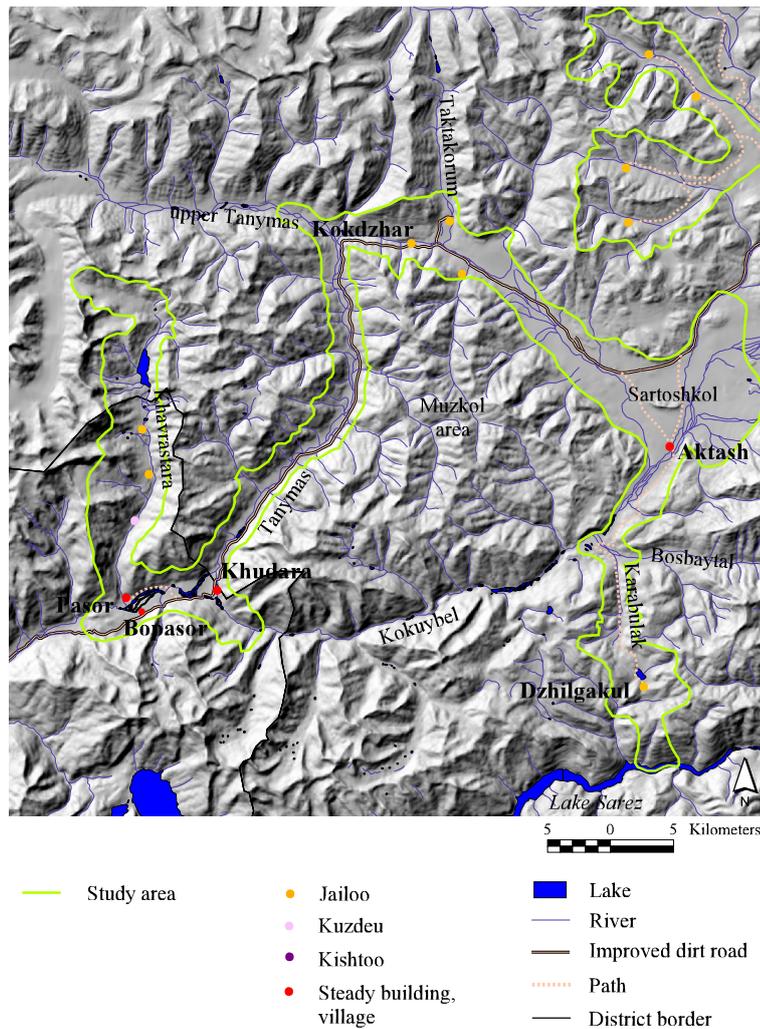


Figure 5.9: Location of the study area in the upper Bartang region and around the Muzkol sanctuary (Khudara - Kokdzhar - Aktash) (Data source: DTM derived from Russian topographic map series 1:200,000 by CDE).

power station in Pasor, all inhabitants of these villages do not have electricity on their disposal.

5.3.2 Selection of interviewees

With respect to the research question of this thesis, a wide range of actors had to be selected for the interviews. The selection of actor categories took into account those affected by the TNP and those ruling it (cf. figure 2.3). Within this thesis, actors are defined as all people that interact in a direct or indirect way with the TNP. Actors with a similar background are integrated within an actor category. An actor group constitutes a subgroup of an actor category and comprises all actors (of the same category) that know each other and act as an entity³ (Grimble and Wellard, 1997).

The generation of the sample was done according to the method of Grounded Theory and corresponds to the theoretical sampling as described by Flick (1998). The actor categories and interviewees were gradually selected and defined during the research process. The classification of interviewees to actor categories was based on

³Only the actors of the TNP authority may be regarded as an actor group, but in the following they are referred to, similarly to the others, as actor category.

Table 5.2: Identified actor categories, sub-categories and number of interview held per category, respectively number of interviewees.

Actor category	Sub-categories	Number of interviews (persons)	Interviews per actor category
Local resource users	Herders	13 (13)	19
	Local hunters	2 (2)	
	Others	4 (4)	
Administration	Local authorities	3 (2)	7
	Regional authorities	4 (4)	
TNP authority	Headquarter	6 (2)	8
	Regional office	2 (1)	
Scientists	National scientists	5 (5)	7
	Foreign scientists	2 (2)	
NGOs	National NGOs	0	3
	International org.	3 (2)	
Tour operators	Hunting companies	3 (2)	4
	Others	1 (1)	
Tourists	National tourists	0	3
	Trophy hunters	1 (1)	
	Backpackers	2 (2)	
Total		51 (43)	

the spatial dimension of the influence of single actors on the TNP and the activities they conduct within its borders. Before the field campaign, certain actor categories and possible interviewees like the 'TNP authority', the 'NGOs', and 'local resource users' could already be identified. As a result of the circular research design further actor categories were defined and specified during the field phase, namely the 'scientists'. Many new members of the actor category 'regional authorities' were selected. Hunters were assigned to the actor category 'tourists'. The actor category 'hunting companies' was extended with 'other tour operators' because not only activities related to trophy hunting were considered.

To identify the persons to be interviewed, a combination of approaches was used. First of all, key persons were identified. These included persons whose knowledge about the situation of and within the TNP was substantial, like staff of NGOs and Nature Protection Departments and researchers. Information gained by these persons gave a good overview of the TNP, its organisation and its natural setting.

In a second step, population data were analysed to identify regions within the TNP that are constantly inhabited or only used as summer pastures. This approach led to the selection of the study sites. There the persons who were most familiar with their natural environment were interviewed. However, interviews carried out on the three selected study areas were often conducted with several persons or in groups. Such interviews and informal talks provided an insight into the daily life of those people concerned by the TNP, their management and use of natural resources.

A third approach to select interviewees was the identification of possible persons by former interviewees. Since the interviews often touched a wide range of themes, interviewees sometimes referred to the knowledge of other people they knew to get specific information.

Due to the limited infrastructure, interviewees could hardly be informed about the interview in advance. If a person living in a remote place was absent during the time of the stopover, the interview could not be realized. Therefore not all intended interviews could be realised. Other interviews had to be shortened because the interviewees were occupied with other work, mainly mowing (local resource user) or meetings (scientists and authorities). However, most people spontaneously agreed to give an interview.

Some interviewee may be assigned to several actor categories at the same time or may change their membership to an actor category. Therefore, the identification of actor categories have to be regarded as snapshots. Table 5.2 gives an overview about the identified actor categories, their sub-categories and the number of interviews that were realised during the field season. Thereby it is to mention that the various actor categories strongly differ in their size. Furthermore, not the same number of interviews could be realised within each category. The small amount of interviews conducted with employees of international organisations, tour operators and tourists does not allow to generalize their statements for the whole actor category. This has to be kept in mind when reading part III of this thesis. For a detailed characterisation of the identified actor categories see chapter 7.

The concept of actor categories does not always refer to the concept of stakeholders. According to Mayers (2001, pp. 2–3), stakeholders are people who have a 'stake', claim or interest in a certain project. They contribute to this project and therefore expect some benefit in return. According to this definition tourists and members of international organisations are not to be declared as stakeholders as long as their interest in the TNP is not existing and they are not directly affected by it. Stakeholders can be individuals, communities, social groups, or organisations (Mayers, 2001, p. 3).

5.3.3 Qualitative data

Guided interviews

The data collection with qualitative interviews forms an open process in which the answers given by the interviewee should not be restricted (Flick, 1998, p. 95). The interviewees were given the opportunity to explain their opinion to themes addressed during an interview. To avoid digressing during a conversation an interview guideline was worked out (see appendix A). This was done according to the research questions outlined in chapter 2. Its design partially follows the structure of the SDA and focuses on the three perspectives current state, target state, and dynamics. Within these perspectives the focus is directed to the problems, needs, options and constraints identified by different actor categories with respect to a sustainable use of resources inside the TNP (cp. subsection 6.1.1). The interview guideline further served as a base to select some themes and questions that were then discussed with all actors of one category. This selection was necessary since due to the differences between the actor categories not all themes could be discussed to the same extent with all persons interviewed.

Interviews were mostly made with an interpreter and translated from Kyrgyz or Russian to English. Interviews were directly noted into a field book and not tape-recorded. Since almost all interviews were conducted with an interpreter, there was enough time for taking notes.

The guided interviews were conducted with key informants, single persons and groups. Many interviews were followed by interesting discussions that often provided

more information than could be gained during the actual interview itself. Most interviewees were not used to a questioning and only relaxed when the notebook was put aside. Therefore interviews in the selected study sites were often only taken after a few days so that the people could get used to the situation. During the time before and after the interview, questions by the interviewee were addressed. Hence an exchange of information could take place, from which, hopefully, both sides could profit.

After each interview a short protocol (postscript according to Flick, 1996, p. 106) was made. It included notes about the interview situation, first impressions, duration and special aspects, such as language problems.

Observation

Participatory observations were conducted as a complementary method within the selected study sites. According to Denzin, participatory observation is a tool that aims at a combination of interviews, analysis of documents, participation, and self-reflection (1989b, p. 157 in: Flick, 1998, p. 157). This enables the researcher to become more and more a participant and thus investigate the themes from a closer position. However, an important aspect of this method is to find a balance between proximity and distance and to be aware of the own influence on the people observed (Flick, 1998, pp. 160–161).

The methods of observation are difficult to handle and the information gained with them has to be scrutinized. Since observations may not be standardized they are difficult to compare and analyse (Flick, 1998, p. 164).

During numerous stays in families inside the TNP the participative observations helped to gain information that gave an insight into the culture and daily life of members of the actor category 'local resource users'. Furthermore, these observations allowed to address special aspects of land use and conservation and thus made it possible to adjust the themes discussed to the local circumstances.

Observations were noted in the field book. The selectivity in the process of writing (what is so important to write it down?) was reduced by taking notes in form of a diary that did not only include the observations but also events in between the observations. These notes were a big help in the analysis of interview data and allowed to a certain extent the reconstruction of specific situations.

Field surveys

Within the selected study areas information on different topics was also obtained by field surveys carried out with the people preciously interviewed. According to the method of participatory transect walk as described by Herweg and Steiner (2002, pp. 39–41), everything mentioned by the informants and everything observed by the outsiders has to be discussed. Thereby, field surveys may supplement already collected data with subjective observations and experiences.

During field surveys topics that were discussed before could be specified at the corresponding sites, such as resource use, degradation of resources and occurrence of specific plant and animal species. This method allowed to assess the importance of certain aspects from the view of the interviewee, since it was he or she who addressed new aspects that were not discussed during the interview.

Information gained during field surveys was noted and mapped (see below).

Some aspects discussed during field surveys were documented by photos, such as typical features of a high pasture, a hay field or a site where *teresken* is gathered. However, since the camera was broken at the very beginning of the field phase, hardly any photos were available to illustrate these aspects in this work.

Workshops

Information on wildlife and legal, as well as illegal, hunting was gained during the Seminar on Sustainable Management of Natural Resources and Wildlife, organised in September 2001 in Murgab by the wildlife study team of the PSP, with the support of Bernhard Nievergelt and ACTED. During this one day seminar herders, illegal hunters, hunting guides, employees of Nature Protection Committee Murgab, and ACTED discussed the state of special wildlife species within Murgab *rayon* and options for their conservation.

Important information from different actors, namely acting on the national and international level, was collected during the international Strategy Workshop for Sustainable Development of the Tajik Pamirs, organised by the CDE in Khorog in October 2002⁴.

General information about Central Asia and different syndrome contexts was gained during student seminars on analysis of environment and development within Central Asia, held from winter 2001 to summer 2002 at the University of Berne⁵.

5.3.4 Quantitative data

Quantitative data was used to complete the qualitative information. Local statistics were mainly collected from the PSP study team in 2001. These data also include numerous statistics on the local and regional level. Statistical data from areas outside the GBAO was not available for this study, thus the characterisation of the TNP only refers to this autonomous *oblast*.

As the research was not conducted in a multinational study team in 2002, the access to certain statistical information was limited, mainly with regards to local administration and regional research reports. National statistics relevant to this report were not available. However, the Red Data Book of the Tajik SSR provided some numbers about threatened and endangered wild species of flora and fauna.

Numbers on wildlife species and herd sizes were given by herders, Farmer Associations and state farms and only refer to selected areas but not to the whole territory of the TNP. Data on size of pastures, agricultural fields and forests were gained by investigations in the research sites. They do not cover the whole park area.

5.3.5 Mapping

Mapping allowed to gain information about the spatial units within the TNP. Different topographic maps with scales of 1:100,000, 1:200,000, 1:300,000 and 1:450,000⁶ served as base for the mapping. According to these maps the CDE created a DTM of the whole Pamiris.

⁴See Breu and Hurni, 2003a.

⁵See Hurni et al., 2002a,b.

⁶All these maps base on the Russian military topographic maps 1:200,000 (different dating during the 1980s).



Figure 5.10: During the Seminar on Sustainable Management of Natural Resources and Wildlife, hunters, hunting guides, employees of Nature Protection Committee, scientists and staff of NGOs compiled and discussed information related to wildlife and wildlife management in the Eastern Pamirs (Photo: A. Haslinger, September 2001).

The maps with the scale 1:200,000 and 1:300,000 (overview map TNP) contained as a special feature the NDVI (Normalized Difference Vegetation Index)⁷. The NDVI builds a degree for photosynthetic activity and is strongly correlated with the density and vitality of the vegetation layer (Neumann-Mayer, 1996). This index gives an impression about the vegetation cover in the park area inside the GBAO. However, its spectrum could not be clearly allocated to a special vegetation type⁸, since densely short grass vegetation on small bands along the rivers and creeks gives the same index as bush and forest vegetation down in the valleys.

The mapping key, worked out for the PSP/CAMP field campaign in 2001, was used as a guideline for the mapping (see appendix C). However, since many of these spatial units, linear features, and point elements have been mapped before in other field works, only a selection of them was considered. Main elements that were mapped within the selected study sites include the spatial units vegetation and its use as pasture or hay field, agricultural land, forests, degraded areas and settlements (mainly temporarily), the line elements temporarily brooks, infrastructure (roads and paths) and special point elements such as historical sites, *mazars*, hot springs, mills and mines.

Some objects such as *mazars*, pastures, mills, agricultural land etc. were additionally recorded with a Global Positioning System GPS⁹ (Garmin, model eTrex) to locate them precisely.

Mapping was often done during field surveys with interviewees. Information could be acquired about pastures, their location and use as well as details of the flora and fauna. These maps served as a base for further discussions on the same topics with different actors and were thus revised several times.

In addition to own mapping, existing maps were collected during the field campaign. These maps mainly contained information about the borderline of the TNP. Since this border was under construction its course varies on all maps. Versions of the course of the TNP border line stem from 1992 (Badenkov and Buzurukov, 1993), 2000 (Novikov and Safarov, 2003a), 2001 (2001a from Kasirov et al., 2001 and 2001b from TNP, 2001, scale 1:450,000), 2002 (TNP, 2002) and 2003 (TNP, 2003, scale 1:450,000). Other information gained from existing maps concern the extension of protected areas (Novikov and Safarov, 2003a), areas allotted to state farms and farmer associations (Badenkov and Buzurukov, 1992; TNP, 2002) and the assignment of hunting areas in Murgab *rayon* (ACTED, 2002). Furthermore, data from the Red Data Book of Tajikistan (Academy of Science et al., 1988) and data of different wildlife censuses (WWF, 2003) were illustrated on maps.

5.3.6 Desktop study

Some information used for this thesis was not gained by interviews, but stems from books and reports that could be viewed in different departments, i.e. the University of Khorog and the botanical garden of the Academy of Science in Khorog.

⁷The NDVI is calculated from satellite images of Landsat 7 with the sensor ETM+ and a resolution of 30 m. Digital data from 150-33 and 150-34 stem from 09/02/2000; 151-33, 151-34 from 08/24/2000; 152-33 from 09/16/2000 and 152-34 from 08/31/2000. Its value is roughly calculated as follows: $\frac{IR-V}{IR+V} = NDVI$ (IR: infrared, V: visible).

⁸This task is analysed by Hergarten, C. (in progress). Investigations on land cover and land use of GBAO by means of a land cover classification derived from Landsat TM7 scenes making use of remote sensing and GIS techniques. Master's thesis, Institute of Geography, University of Berne.

⁹The GPS is a means of locating a point according to its position on the globe. It works through a system of 24 satellites in orbit around the Earth which emit successive radio signals at synchronised times and dates. These data describe the position of the satellite in question. On the ground, a user decodes these position signals and records precisely the date and time of reception. Calculating the satellites' position makes it possible to determine the position of the receiver in relation to a reference point with varying degrees of precision (Leonard and Bottom, 2000, p. 27).

Many reports used for this thesis have not been published and are so-called grey literature¹⁰. Data about general features of the GBAO stem from numerous reports written within the PSP project (2001 until 2003). Data about pasture management and vegetation analysis were written by ACTED Murgab (1998 until 2003).

Some background information for this thesis was taken from the Internet. Mentionable are especially the reports about the state of the environment of the Tajik Republic from 1998 to 2002. These reports were compiled by the Tajik Research Laboratory for Nature Protection in working partnership with the GRID-Arendal information centre¹¹.

5.4 Data analysis

Data analysis took already place during the phase of data collection to be able to select interviewees and further specify focal points of the themes. Data analysis in the field was done by abstracting the notes after each interview and by a revising of the interview guideline, to reformulate questions, add new ones or delete those who made no sense. Furthermore, the situation and conditions of the interviews were analysed with the interpreter. Impressions about the behaviour of the interviewees were noted. This procedure helped to improve the application of instruments for the collection of data.

5.4.1 Text analysis

Method

Interviews with a guideline guaranteed a certain degree of comparability of the collected data. This data constitutes a text that has to be analysed with the help of codes and superior categories to assess its meanings (Strauss and Corbin, 1996; Flick, 1998). There are numerous methods for doing so. According to the concept of qualitative content analysis the codes and categories are defined before the analysis. Following the concept of Grounded Theory, the codes and categories are inductively worked out during the analysis (Titscher et al., 1998, pp. 74–105). For this thesis the concept of Grounded Theory was combined with the method of thematic coding which is described in more detail by Flick (1996, pp. 206–211). This procedure allowed to add new categories to the ones that were already defined previously and thus constitutes a middle course between the qualitative content analysis and the approach of Grounded Theory. During the analysis of the interview data it was attempted not only to reflect the information that had been given but also those things that had been concealed.

Procedure

The notes taken during and after interviews were transliterated onto the computer after the field season. Parts of the texts contained expressions in Russian and Kyr-gyz. These were translated into English with the help of two dictionaries (Krippes, 1998; PONS, 1995).

Since the data analysed was huge, the codes were arranged hierarchically in categories which were further separated in main and subordinated codes. The system

¹⁰Grey literature are reports, papers, diploma thesis, and technical reports and documents not published commercially.

¹¹GRID-Arendal is a Norwegian foundation, established by the Norwegian Ministry of Environment, to support the United Nations Environment Programme (UNEP). It aims to provide decision-makers and the public with improved access to environmental information, communications, and capacity building services for information management and assessment. For further information see <http://www.grida.no/enrin/soe.cfm?country=TJ>.

of categories was developed already before the coding and did not arise from the integration of codes as described by Titscher (1998). The categories refer to the research questions and are made up of four aspects (cf. appendix B):

- The target and actual states of the TNP, its organisation and its relevance for nature conservation and the Pamirs
- The natural environment and its elements within and along the park
- The actors within the scope of the park, their perception concerning the use of resource and their visions about the TNP
- The interactions between the natural elements and the actor categories and resulting or possible conflicts

In a first step the text was roughly attributed to these primary categories. In a next step, the text was attributed to the categories on the second and third layers. Then the text was coded with the computer software atlas.ti 4.2 which bases on the process of coding according to the Grounded Theory. Quotations were attached to codes which were continuously defined in the beginning (open coding). The coded quotations included single words, phrases or paragraphs. They were sometimes supplemented by comments (memos) from observations. Later on, the quotations could increasingly be assigned to already existing codes. The first texts that were coded were reviewed at the end with respect to the newly defined codes during the process of coding. Codes were also defined for quotations that did not correspond with one of the above mentioned categories and marked as so-called 'open category'. The quotations assigned to several codes within each category were then analysed and interpreted. By doing so, the focus was enlarged from the single interviews to all interviews of an actor category.

Data illustration

The statements of the different actors were paraphrased as the interviews were carried out in different languages (Kyrgyz, Russian, and English) and with different interpreters. Due to this the data has already been interpreted several times and therefore a textual citation of the interviewees was no longer possible.

5.4.2 Maps

The mapped spatial units were drawn on digital maps and then edited with the software ArcView GIS 3.2a. Linear elements, namely the park boundaries, were scanned with a bobbin scanner (254dpi) as RGB (24bit and then 8bit). Afterwards the digital layer was geo-referenced with the northern frontier (Tajikistan - Kyrgyzstan) and some natural features (affine transformation 1st order) and saved as TIFF file format. In a further step the borderline was geo-referenced in more detail according to natural features like the topography (topmost points, ridges), rivers and roads.

With ArcView the expanse of different spatial units within the selected research sites could be assessed. Together with additional information from the PSP GIS database (administrative borders, settled areas, etc.) these numbers served as a base to calculate the coverages of the defined spatial units (ecosystems) for the whole park area, respectively the area of the TNP inside the GBAO.

5.5 Data quality

5.5.1 Availability of data and gaps

Inventories of animals, vegetation and ecosystem as well as other written information were rarely available in the field. This is caused by the fact that data is often old

and stored in research institutes where they are hardly accessible to foreign students. Furthermore, scientists and employees of different departments reported that a lot of scientific data was taken by the Russians and is now stored in Moscow or St. Petersburg and not available for Tajik researchers themselves.

5.5.2 Data reliability

A certain quality of data of this thesis was obtained with the concepts of reliability and validity.

The concept of synchronic reliability demands a consistency of the results gained at the same time but with different methods of data generation applied (Gutscher et al., 1996, p. 58). This was realised with an ongoing crosschecking of the data collected with different methods. Statements from interviews were verified with information on the maps, information from field surveys, other interviews and literature. However, because interviews were translated and noted, it was possible that certain statements could be blended with personal interpretations of the interpreter or the researcher. This problem was approached by the separation of interview data and protocols in different field books and a revision of the interviews in the evening. Most interviews were interpreted by the same person and all notes were taken by the researcher. The analysis of the data was completely done by the researcher, but numerous discussions different people closely involved helped to assess the data from different perspectives.

The concept of validity addresses the question if the version that is reproduced by the researcher is justified in the object of investigation. This is a basic condition of qualitative research. Furthermore, the concept scrutinizes if the theoretic construction of the researcher is to be found in the construction of those who were interviewed and if this reason is comprehensible for outsiders (Gutscher et al., 1996, p. 58). Today the concept of validity is more and more displaced by the concept of validation. According to this concept it is not so important to analyse each single step of the research process, but to establish a certain transparency throughout it. With respect to this claim it has to be pointed out that the data of this thesis was selected and restructured several times during the process of translation, but also with taking notes and asking question, by analysing it according to the Grounded Theory, and by its illustration within this thesis. The reader of this thesis adds a further interpretation. As a consequence of this repeated analysis the information given in the following chapters has no claim on any completeness and general accepted verity, but has to be put into perspective with my own perceptions. Since this modification of the acquired data hampers its revisal, the process of analysing has to be made transparent with a detailed description of the applied methods and approaches as given above (Gutscher et al., 1996, p. 58).

Another approach for quality assurance in research is the method of data triangulation. This approach does not focus on checking results but on a systematic extension of the options of cognition. Thereby different data sources, researchers, methods and theories are played off against each other to check the dependence of the results from the methods (Gutscher et al., 1996, p. 58). With a combination of different methods of data collection and data analysis this claim was aimed to be fulfilled within this thesis.

Part III

Results

Chapter 6

Soviet and Tajik management of nature conservation

Conservation of natural resources started a long time ago in Tajikistan. Already in ancient times special areas such as forest plots, springs and *mazars* have traditionally been protected by resident people (Aknazarov et al., 2002, p. 190). At a later date, the use of natural resources was intensified under the Soviet ruling. This was followed by an increase in nature conservation activities. First areas were segregated from any use to guarantee the strict conservation of natural features. Even though nature conservation activities established at the same time in many other parts of the world, the Soviet concepts of nature conservation and their understanding of nature differ from western approaches. Since they build the backbone of today's conservation activities and thus also for the TNP they are highlighted in the following chapter.

Section 6.1 gives an overview about the Soviet understanding of nature within the different spheres. Furthermore, concepts and instruments of nature conservation are outlined. The second section of this chapter focuses on the development of nature conservation activities in the Tajik Republic, the establishment of protected areas in the Pamirs and the first attempts to create a national park in this region. It is worth mentioning that only those features are roughly described that are assessed as eminent for the classification of this thesis. For a detailed outline of nature conservation activities within the Soviet Union see IUCN (1992); McNeely et al. (1994); Meessen (1992); Weiner (1999).

6.1 Basic conditions of nature conservation in the Soviet Union

6.1.1 The economic sphere of nature conservation

Rational use of natural resources

Soviet nature conservation based on the principles that the soil, water bodies, forests and other natural resources are owned by the state and the activities in nature conservation¹, the scientific progress and the rational use of natural resources² form an entity. The so-called technical environmental protection was part of the national economy (Meessen, 1992, p. 29). Thus the system of management of economic

¹For detailed information about the definition of the Soviet terminology of nature conservation see Meessen, 1992.

²Rational use of natural resources may be characterised as an effective use of resources to maximise the output while at the same time their continuity is guaranteed with the help of rehabilitation measures. Since rational use of resources focuses on a spatial separation of resource use and resource conservation it is not used synonymous with sustainable use of resources within this thesis (cf. chapter 4).

and natural resources included different institutions of research, organisations and associated public authorities (Nikol'skii et al., 1994).

Even though nature conservation was always geared to the economy, the relationship between the rational use of natural resources and their conservation was not really clear during the Soviet period, respectively changed from time to time. The terms 'rational use of resources' and 'nature conservation' were not defined according to a theoretical concept. At the beginning of the Soviet leadership the use of natural resources was regarded as the emphasis of nature conservation. With the economic development nature conservation was distinguished as encroachment upon nature to achieve economic benefits. Only when the negative impacts of the economic development on the environment became obvious, was nature conservation also directed toward the protection of natural resources from harmful economic exploitations (Meessen, 1992, p. 32).

Conservation of natural resources was mainly realised by the creation of protected areas. Public access to natural resources was regarded as incompatible with the objectives of nature conservation and thus the protected areas were not accessible to the public. This understanding provided the major source of conflicts following the establishment of protected areas (Nikol'skii et al., 1994). Nikol'skii described the understanding of nature conservation by the administration as follows: "Satisfying the demands of the local population is detrimental to the conservation status of protected areas" (1994, p.147).

The combination of rational use of natural resources and their conservation within selected areas led to the intense exploitation of resources in some areas while others remained almost untouched. In the mountain regions of the Soviet Union the exploitation of natural resources caused severe destabilisation of soils, degradation and erosion. These processes increased the risk of landslides and mudflows threatening local inhabitants of the mountains (Badenkov, 1990, p. 131). In other regions of the Soviet Union many natural landscapes such as marshes and flood plains were segregated as protected areas and remained in a relatively natural condition. This segregation was often not made on purpose but since the utilisation of resources within these areas was too complex and not lucrative they were put under protection (Meessen, 1992). Such protected areas served as compensation for other areas that were intensely used within the economic process. These remarks point out that nature conservation activities were always dependent on economic interests and activities and thus could not be considered separately.

The subordinate position of the mountain areas to the interest of the centre

The character of the development of mountain resources meant that the mountains and their people were subordinated to the interests of the lowlands and the centres.

Under the Soviet ruling a hierarchical system of centralised planning was established that controlled all land, forest and water resources and practically ignored the interests of local people. The exploitation of natural resources out of the mountains but also their protection within selected areas was coordinated by a network of central ministries and departments (Nikol'skii et al., 1994). Until the late 1980s there was no compensation policy for paying for the exploitation of these resources (Badenkov, 1990, p. 131).

The centralised management system was in charge of all research. A network of testing stations and testing grounds in the Pamirs was established and used for both fundamental and applied research. Scientists developed recommendations on 'rational' uses of different resources and their management and were thus closely linked to the economy. Inter- and transdisciplinary or participative approaches were not applied (Nikol'skii et al., 1994). Since research was controlled by the state,

scientific investigations focusing on the ongoing deterioration of mountain lands did not pay much attention to the principal cause, the command-administrative management system.

Umarov (1998) identifies this administrative management system, which governed all spheres of social life and held sway over nature and natural resources for decades, as the main factor for the unsustainable development of mountain areas. He outlines three negative effects the command management system had on mountain regions. First of all, planning targets and indicators of success were rigid, unbalanced and scientifically ungrounded. Very often there was no coordinated relationship between the objectives set by the state and the means of achieving these objectives. Furthermore, local organisations were ignored and humiliated. Local bodies such as forest committees and *rayony* expressed the opinions of the local population, and had a mission to monitor the ecological balance in the mountains. However, large state projects in mountain areas to build hydroelectric power stations, reservoirs and to increase the number of livestock on high pastures did not take into consideration the opinion of these local organisations but only fulfilled the interests of government departments. These were often claimed as public interests, but were not necessarily those of the local population or environment. As a third negative effect Umarov mentions that the command management system gave "free rein to the dogmatism of bureaucratic managers, in thinking and economic and ecological behaviour. This led to the natural resources of mountain territories being used in an irrational, wasteful way. Official dogmatism was expressed particularly in the unthinking transfer to mountain areas of those forms of farming which had been adopted in the lowlands. For example, the process of setting up collective and state farms in the mountain territories completely ignored the conservation of natural resources. Any change introduced from the top down in the agricultural development of lowland areas was automatically extended to farms in the mountains" (Umarov, 1998, p. 191).

6.1.2 Nature conservation within the social and the political spheres

While the persons that were responsible for a state company were taught that nature is the supplier of resources which are used to reach the planned economic targets, most Soviet citizens' attitude toward nature was rather diffuse and lyrical. The idea that nature is inexhaustible and may bear everything was popular during the last century (Meessen, 1992, p. 35).

The oldest nongovernmental nature conservation organisation in the former Soviet Union evolved from a student movement in the 1960s to protect the environment (Deever and Pirigova, 2001). Many of the activists of the so called Druzhina regarded undisturbed nature as some sort of sacred space and thus their activities focused on the conservation of 'pristine' nature within *zapovedniky*. Nature was divided into 'sick' and 'healthy' and similar to that in the United States, the Soviet nature conservation movement advocated a distorted image of nature within protected areas as pristine, self-regulating, ecological communities that existed in a healthy equilibrium until the appearance of humanity (Weiner, 1999, p. 443). In its beginning, the activities of Druzhina mainly focused on catching poachers. Later on, they took up environmental education as a fundamental task. Only in the 1980s when nuclear and chemical disaster struck many regions of the USSR, a strong environmental movement arose (Deever and Pirigova, 2001).

According to Weiner (1999, p. 444), nature conservation for a long time served as a surrogate for politics as actual political discourse was prohibited. The difference between nature conservation movements of the Soviet Union and the ones in western countries was "that in the Soviet Union nature conservation was used to stake out an independent sphere where activists ... could engage in self initiated civic activity.

Through that, they sustained professional and social identities that were also self-generated, in tacit opposition to the behavioural and professional norms set by the Party-state” (Weiner, 1999, p. 446). Nature conservation activities thus did not only focus on the ecological sphere, but were an instrument to organise society and confess interests of the public to the state.

6.1.3 Soviet instruments of nature conservation

The legal basis and organisation of nature conservation

Different to nature conservation in western countries, the temporal range of activists was set in the long run within the USSR state programmes³. Nature conservation was thus not only acting in reaction to short term problems but specifically long term visions were created. From the 1960s numerous laws concerning nature conservation and the use of natural resources were enacted, mainly on the base of scientific recommendations. They built an ideal base for the management of natural resources. However, most of these laws were not implemented and thus the efficiency of nature conservation was low (Meessen, 1992, p. 54).

The organisation of nature conservation activities was characterised by a split-up of competences and responsibilities into numerous departments and ministries. Until today the complex structures continue to have an effect on the allocation of rights and duties. The responsibilities for the management of protected areas was split among 28 ministries and departments. As a consequence, ecological duties could not be effectively implemented. Conflicts of interest were common between the different ministries but also within them (Meessen, 1992). A single ministry for example was instructed with the control and protection of natural resources but at the same time it was also responsible for their exploitation. Furthermore, synergies between different tasks of nature conservation could not be exploited since the conservation of species and ecosystems was often separated from the conservation of other resources such as water and air. Only in 1988 the State Committee for Nature Protection was founded to coordinate nature conservation within the institutional and judicial sphere (Meessen, 1992).

Red Data Books as base for the protection of species

One important sub area of nature conservation was the protection of species. In the 1970s the Red Data Books were established on the basis of detailed inventories of flora and fauna species for every socialist republic. The Red Data Book of the Tajik SSR was published in 1987. It lists 60 rare, endemic or endangered species of flora and 58 species of fauna of the Pamirs. These species are most concentrated in the western valleys along the Pandzh river and the region of Darvaz. To protect the species listed in the Red Data Book, the authorities proposed to implement new protected areas, mostly as small *zakazniky* for single species (WWF, 2002).

Until today the Red Data Books give a good survey about the rare and endangered species, their distribution, population dynamics, typical habitat, biology, causes for their status, and possible protection and reproduction measures. Most Red Data Books only include wild species, endangered domesticated species and rare threatened ecosystems are not mentioned (cf. Academy of Science et al., 1988). Many species included in the RDB were protected in nature sanctuaries and other protected areas.

³These included five-year plans as well as long-term measures (15 years) (NABU, 2002, p. 4).

Protected areas as base for the conservation of ecosystems

To extend the conservation from single species to whole ecosystems, a vast system of protected areas was established. The main focus was set on the creation of scientific nature reserves rather than on national parks (Nicol'skii et al., 1994). According to the state regulations, nature reserves were set up to preserve natural complexes typical or unique to a given landscape in a natural state to study natural processes and to develop scientific principles for nature conservation.

Appropriate dimensions of protected areas were not scientifically determined. The major objective of the protected areas network was representativeness (Nicol'skii et al., 1994). The areas were selected according to physical-geographical classification and specific characteristics such as species richness. However, in reality they were often separated according to factors of its surrounding (such as population density, industrial sites) than to criteria of diversity (Yazan, 1990). Thus protected areas were restricted to residual landscapes that were not occupied by other forms of land use and withdrawn from the sphere of economic activities. In Central Asia the majority of protected areas have been established in mountain ecosystems (Krever et al., 1998). Since other criteria to select protected areas were ignored, cultural landscapes were hardly protected (Yazan, 1990, p. 404).

The responsibilities entrusted to protected areas included to provide territory conservation (nature reserves and sanctuaries), to conduct research (nature reserves) and to promote assistance in training and education (national parks) of researchers and other people about problems of nature conservation and rational use of resources (Yazan, 1990, p. 397). A huge amount of data was collected mainly in nature reserves which build an important and detailed data base for present and future conservation activities. However, data bases were not linked together or were practically unavailable to scientists at large (Badenkov, 1990).

The staff of protected areas was mostly composed of administration staff, forest conservationist and scientific staff. The majority of the scientific staff had biological educational backgrounds, traditionally as game biologists. This appeared to become a hindrance to the development of modern ecological research in protected areas. According to Nicol'skii, there was a shortage of specialists in invertebrates and lower plants, microbiology and soil in the beginning of the 1990s. Due to extremely low wages, the qualification of many protected areas staff was identified as low (Nicol'skii, 1994, p. 146).

Many problems of protected areas arose due to the cutting of traditional rights of local people. Due to the restrictions inside protected areas and the fact that local traditions were not considered in the park management, traditional knowledge related to the management of natural resources got lost. As a consequence, conservation regimes were often violated by local people, mostly by uncontrolled cattle grazing within protected areas (Nicol'skii et al., 1994).

Despite these deficits, the system of protected areas of the USSR played an important role in the conservation of rare and endangered species of flora and fauna. Furthermore, they enriched adjacent areas through the process of natural dispersion of these species (Yazan, 1990, pp. 407–408). The values of these protected areas handed down by the Soviet Union were at risk of becoming lost due to social and economic changes during the transformation process from a planned to a market economy.

Since nowadays the categories of protected areas in Tajikistan are more or less the same as during the Soviet period, a brief outline of the categories of protected areas within the Soviet Union is given here.

Zapovednik: Biodiversity conservation and protection of natural resources was mainly implemented with the establishment of *zapovedniky*, nature reserves, which accounted for the majority of protected areas within the USSR. Their establishment

was based on the principle of representing the diversity of all natural landscapes and ecological zones in the former Soviet Union (Danilina, 1996, p. 9).

Zapovedniky were a priori displayed as totally protected areas according to the IUCN Management Category I (strict nature reserve). These protected areas were always declared as exclusive state property. This implies that the state could make decisions about the use of natural resources without taking into account the opinion of people living in and around these areas (Danilina, 1996, p. 10). As a consequence, protected areas often provoked negative reactions by resident people (Nikol'skii et al., 1994). Disputes over the use of nature reserves emerged because while local people were under pressure to cease their traditional land use, officials of the state used the nature reserves as hunting resorts. This reinforced the image of *zapovedniky* as forbidden territories for local people (Danilina, 1996, p. 10). However, some forms of extensive traditional land use often intruded the *zapovedniky* from the surrounding buffer zones (Krever et al., 1998).

Zapovedniky did not only contribute to conservation, they also constituted a field laboratory for scientific research (only natural sciences). All *zapovedniky* had a scientific staff and were included in a network of scientific research institutions. In 1990 most *zapovedniky* were part of the *Goskomprroda*, other reserves were managed by the State Forest Committees or the Academy of Science (Nikol'skii et al., 1994). Traditionally the staff of nature reserves of the former Soviet Union prepared so called annals of nature on their territories. They included annual observations on animals and plants. These data provided a giant data base on the state and dynamics of the environment in the USSR and served as the basis of the system of ecological monitoring in protected areas. Nevertheless, this unique information was not properly organized. Annals were not collected in centralized archives, systematic index, or unified database for storage and computer treatment of the information did not exist (Nikol'skii et al., 1994, p. 150).

Zakaznik: *Zakazniky*, nature sanctuaries or partial reserves, had been established to preserve and regenerate certain flora and fauna species and to regulate the use of natural resources in terms of a 'rational use'. Since the protection regime of *zakazniky* varied according to the purpose of the reserve, they cannot be assigned to a specific IUCN category. Most *zakazniky* focused on the recovering of certain flora and fauna populations that were supported within a specified time period. Therefore the area was often only fully protected during a certain season (breeding and mating seasons). Traditionally, these protected areas were established for the conservation of the habitats of migratory (game) species, their reproduction and their use by controlled hunting (Krever et al., 1998; Nikol'skii et al., 1994).

The status of conservation of *zakazniky* was lower than the one of *zapovedniky*. They also included a smaller area. From this it follows that *zakazniky* were more easily created than nature reserves or national parks and constituted the most widespread management category of protected areas in the USSR.

The establishment of *zakazniky* provided the legal basis for the restriction of economic development within these areas. According to NABU (2002, p. 26), the maintenance of these restrictions and the data on the borders of *zakazniky* listed in the official documentations of various institutes was far more important than the actual physical conservation in the field.

The status and administration of *zakazniky* varied in the different republics of the USSR. Those of republican importance had their own staff and were reserved for longer periods, however, many of the sanctuaries had a limited or no management and effectively remained 'paper parks' (Nikol'skii et al., 1994, p. 142).

National'nyi park: National parks included special objects of nature, valuable for ecological, historical or aesthetic reasons and also took into consideration arable

land. They were mostly established on state forest property and managed by the State Forest Committees (Nicol'skii et al., 1994).

National parks aimed at the promotion of a large spectrum of tasks. They focused on a combination of conservation of the natural and cultural heritage with recreation and ecological education⁴, as well as research (NABU, 2002, p. 27). With the establishment of this relatively new category the growing need of the people to experience nature and, on the other hand, to improve their level of ecological awareness should be met.

To realise the different functions within the national park, its area was split into zones with different priorities in its use (Yazan, 1990, p. 403). Zones included areas in which economic activities were controlled, and strictly protected zones where any economic activities and public entry were forbidden. Other zones were open for outdoor recreation but allowed no other economic activities. Within peripheral buffer areas habitation and sustainable levels of exploitation of natural resources were permitted (IUCN, 1992).

Other types of Soviet protected areas were the *Pamyatnik prirody* (nature or national monument) and the *Zapovedno-okhontrich'ye khozyastvo* (national hunting reserve or hunting sanctuary). They are not further described here since they were not present in the Tajik Pamirs.

Research as the basis for recommendations concerning the use of resources

The above mentioned instruments of nature conservation were strongly influenced by the scientific community of the USSR. Scientific work was regarded as an instrument to work out recommendations for the management of nature and its resources with respect to regional economic development. Especially mountains and their ecosystems were intensely studied. At the same time, anthropogenic influences were hardly addressed, as the following remarks point out.

In the 1960s the growth in society's demands for access to natural resources, increasing pressure on the environment, and efforts to achieve optimal utilization of resources prompted the elaboration of the concept of Constructive Geography by I.P. Gerasimov. This concept focused on a combination of fundamental and applied research to bridge the gap between science and practice. As Gerasimov outlined, "the tasks of constructive geography can only be explored and fulfilled within the frames of an integrated system of geographical knowledge" (translated from Gerasimov, 1985 in: Badenkov, 1990, p. 136). The concept of Constructive Geography was mainly applied to mountain studies. Despite the demand for integrated research, most studies did not include investigation of anthropogenic impact on the environment. The scientific work was mainly conducted inside protected areas and focused on isolated sectoral studies of biology and physical geography (Badenkov, 1990, p. 136).

In the 1970s the USSR became a member of the MAB Programme. The main research topics of the MAB Project 6 focused on sustainable regional development of mountain areas, the assessment of stability of mountain geosystems, natural hazards, and the development of scenarios for integrated development of mountain regions. Major programmes of mountain studies outside MAB-6 included, among others, analysis of interaction of highland - lowland landscapes and simulation modelling for management of natural resources (Badenkov, 1990).

However, despite the numerous research projects, Badenkov concluded in 1991 that there was no adequate development concept of sustainable regional environ-

⁴Environmental education was mainly addressed to town-dwellers. During organised educational tours in national parks they were taught the beauty of undisturbed nature (Weiner, 1999).

mental development for mountain regions. Furthermore, integrated interdisciplinary studies did not evolve to any significant extent and isolated individual studies predominated. As a result of these limitations, practical implementation of the results of research for the management of resources and economic development in mountain regions was fragmented and limited (Badenkov, 1990, p. 137).

6.2 Nature conservation activities in Tajikistan

6.2.1 The emergence of 'zones of risks'

Large scale projects such as the establishment of the cotton fields in the Tajik lowlands under Soviet ruling were accompanied by severe impacts on people and nature. The construction of the gigantic Rogun hydro-power plant on the Vaksh River led to the flooding of fertile lands that are in short supply in this area. Negative effects on man and nature also occurred from the production of non-ferrous metals which were not adapted to the ecological situation. These interferences into the livelihood of mountain people during the Soviet era ruined the traditional economic and cultural patterns and over the years adversely affected their environment (Badenkov, 1990, p. 133).

Already in the 1930s, when scientists compiled inventories about the available natural and human resources and their productive potential in the republics of the Soviet Union, Tajik scientists outlined several problems of 'zones of risk'. They referred to areas of acute erosion, deforestation, degradation of rangeland, reduction of biodiversity, and increase in the risk of natural hazards. The range and magnitude of the arising environmental problems were common to most mountain areas of the world, but under the system of centralized economic planning they were ignored (Badenkov, 1990, p. 133).

The environmental problems facing Tajikistan today are, to a significant degree, the result of these large scale projects and erroneous planning and management of mountain resources.

6.2.2 Protected areas in the Pamirs during the Soviet era

When the negative effects of the exploitation of natural resources became obvious, the economic activities were not changed. Instead, as a sort of compensation, marginally used sites were separated as protected areas. However, special resources were strictly protected during the Soviet period even though they were not included in a protected area. In the Western Pamirs for example, only few forests were included in a protected area, but all forests were under strict protection (NABU, 2002, p. 26).

Large protected areas were established in the remote areas of the Eastern Pamirs, that were still relatively untouched since the exploitation of natural resources was too costly and thus not lucrative. Protected areas in regions that were at risk were of smaller scale and hard to implement. Some protected areas were ineffective since economic activities intruded their boundaries (Badenkov, 1990, p. 134).

Within the area of the Tajik Pamirs, four protected areas were established during the Soviet era (see figure 6.1). Due to their remoteness they stayed relatively untouched for almost 50 years:

Muzkolski *zakaznik*: This sanctuary was established in 1972 between the river Tanyamas and Kokuybel on an area of 67,000 ha to protect high mountain flora and fauna species. It forms the heart of the TNP. It is subordinated to Murgab *rayon* and managed by the Forest Association.

Pamirski zakaznik: In the north-eastern Pamirs, along the border with Kyrgyzstan, an area of 500,000 ha was established to protect and use wildlife resources such as the Marco Polo sheep. However, its borders are not really clear and may differ from those shown in figure 6.1. The Pamir sanctuary may be regarded as initial area of the TNP, formerly named Pamir National Park (see below).

Sangvorski zakaznik: This protected area was founded in 1972 with the aim to protect the snow leopard and other fauna as well as forest ecosystems of the Pamirs. It comprises 51,000 ha and has primarily been included into the TNP, however, on the latest map of the TNP it only borders the TNP in its very western edge. It is subordinate to the Tavildara region and the forest department of Komsomolabad.

Zorkulski zakaznik: In the south-eastern Pamirs around lake Zorkul an area of 87,700 ha was put under protection in 1972. It aims at the conservation of rare species such as the Indian goose (*Anser indicus*). In 2001 the status of this area bordering Afghanistan was changed to a *zapovednik*. It is not included in the TNP but attempts are made to enlarge the TNP to the south to merge it with the Zorkulski *zapovednik*. It is managed by the Forest Association and subordinated to Murgab *rayon*.

First attempts to create a national park in the Pamirs

Soviet scientists carried out studies in the Pamirski *zakaznik* in the 1970s and to increase their scope, they were interested in enlarging the study area to a *zapovednik*. Already in 1978 several scientists from the Soviet Academy of Science thus formulated the aim to establish a national park in the Tajik Pamirs. However, since they were not able to represent their interests on the government level, their demands were not met, as a former employee of a state department explained. Thus the areas of the Tajik Pamirs continued to be used as experimental field for Soviet scientists, as hunting grounds and pastures for both wildlife and livestock.

In the course of *perestroika* and *glasnost*

During the latest phase of the Soviet era, scientists resumed the discussion about the establishment of a national park in the Pamirs. Representatives of the Academy of Science and the Ministry of Nature Protection worked out a proposal about the Pamir National Park. This proposal included a design of the area and a zoning concept (see Badenkov and Buzurukov, 1993; Cunha, 1993). During the Parks, Peaks, and People workshop held in Hawaii Volcanoes National Park in 1991, an action plan for the implementation of the Pamir National Park was developed with international participation (Cunha, 1993). This first proposal for the establishment of a National Park in the Pamir Mountains was approved by the Tajik Government on July 20th 1992.

The motivation to support this park was not only based on the interest to increase scientific activities as in 1978, but may be found in the awareness that the remote areas, containing highly vulnerable ecosystems, were more and more coming under human pressure. Under the pre-independence policies many Pamiri people migrated back to their homeland, reclaiming villages within these areas that were not intensely used for a long time (Cunha, 1993). Even though the impact from resident people to nature was increasing, local people did not worry about the state of their resources since they were still receiving subsidies from outside the mountains.

The Russian Academy of Science suggested including the region as a Biosphere Reserve in the UNESCO's MAB Programme. Other actors proposed to investigate another transborder protected area in the Pamirs that may form a key component of a potentially large Central Asian transborder peace park, linking the Pamir

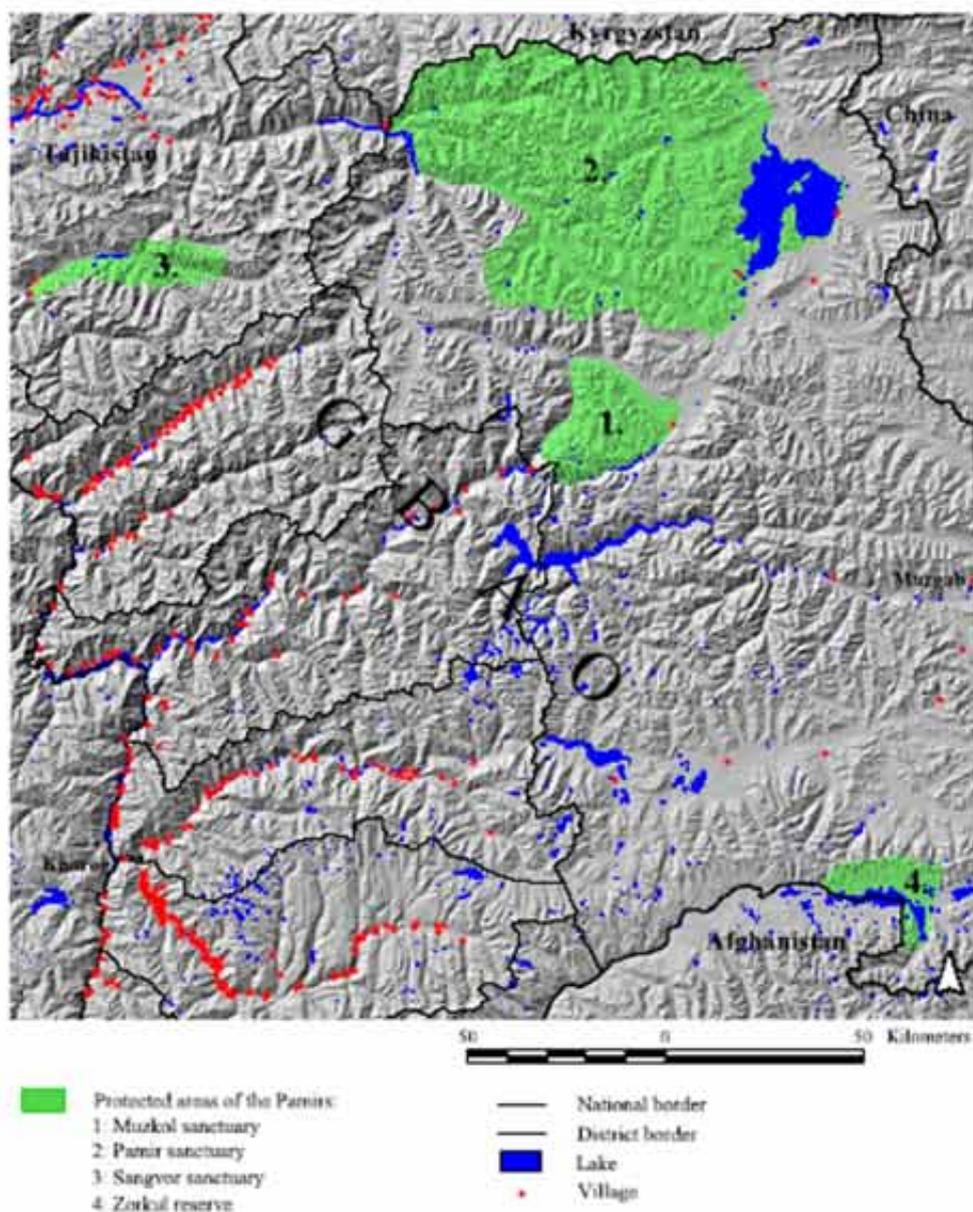


Figure 6.1: The protected areas of the Tajik Pamirs in 1990 (Data source: DTM derived from Russian topographic map series 1:200,000 by CDE; protected areas according to Badenkov and Buzurukov, 1993 and Kasirov et al., 2001).

Mountains in China, Pakistan, Afghanistan and Tajikistan together as a regional mountain protected area (Cunha, 1993). These intensions were interrupted by the political events that led to the dissolution of the USSR and to the Tajik civil war.

6.2.3 Challenges of nature conservation in the independent Tajik republic

The co-occurrence of several unique conditions at the end of the Soviet era created momentum of its own and made it impossible that the nature conservation activities of the newly established republic could seamlessly tie in with the basic work carried out under Soviet ruling.

Legislation and administrative structure

Large parts of the Soviet environmental legislation remained active in Tajikistan. It was supplemented by new laws in the 1990s. Due to the fact that some of the outdated Soviet legislation contradicts a number of newly adopted laws, environmental legislation could not attain a sufficient legal basis for conservation of natural resources (Krever et al., 1998). Furthermore, the weak administrative structure could hardly enforce legislation. The enforcement function of conservation belonged to the State Committee on Nature Protection that has been established in 1988 by Tajik government officials and private business people (Krever et al., 1998). It was reformed into the Ministry of Environmental Protection in 1992 and renamed in 1994 to the Ministry of Nature Protection as it is still called today. At the same time most of the conservation organisation was under the auspices of the Forest Association (*Tadjikles*).

As a former employee of the Department of Hunting and National Reserves explained, the Ministry of Nature Protection did not add much to nature conservation issues, but was competing for money and power with the already existing Forest Association. The Ministry of Nature Protection tried to get more competence on natural resources and to issue permits and licences while it left the most difficult tasks concerning nature conservation to the *Tadjikles*.

Due to a lack of funding to provide employees of nature conservation agencies with equipment and materials and due to the disorder during the civil war, control of the remote protected areas in the Pamirs faded and so they could not prevent an overexploitation of certain natural resources.

Consequences of changes in the use of resources

In the course of privatisation the natural resources of protected areas became more and more used in a commercial manner. As a result of these processes, the pressure on natural resources dramatically increased.

The combination of a rise in poverty, a relaxation in government regulations, and easier access to arms during the civil war increased the hunting pressure on wildlife (Krever et al., 1998). Private hunting companies were established mainly in the Eastern Pamirs. International sport hunting hardly respected protected areas and regulations concerning the treatment of species included in the RDB of Tajikistan. As reported by different actors, besides private companies different Ministries and state employees were involved in this lucrative business. Together with the State Committee for Foreign Tourism (*Goskomintourist*), *Tadjikles* organized hunting tours in the upper Belenkik area in the heart of today's TNP. Wildlife was also coming under increased pressure by the local population. Meat was not available on the bazaar or was very expensive and livestock was not regarded as a source of meat but as an asset (Domeisen, 2002; Hangartner, 2002). This resulted in intensified illegal hunting activities by local people as well as by state employees. Illegal hunting was especially widespread during and after the civil war, since the availability of guns and ammunition became easier. The animals most severely affected by the international hunting business as well as by local hunting were the Marco Polo sheep and the Asiatic ibex.

The discontinuation of the supply of food, fuel and fodder from outside the mountain areas meant they had to be substituted with local resources. Missing fuel was substituted by wood and bushes in the western valleys. Logging increased and expanding clearing of bush land along the steep slopes led to an increase of soil erosion (NABU, 2002). In the Eastern Pamirs, woody sub-shrubs (*teresken*) were intensely used as substitutes for coal. Intense gathering of these plants led to a reduction of the available biomass for livestock breeding and caused an increase in degradation processes. Degradation and erosion were supported by a lack of

knowledge in adapted use of resources and a reduction of mobility. Even though the number of livestock decreased, the pressure on pastures close to villages was intensified. Herders could not afford the means of transport to reach the remote pasture areas that were used during the Soviet era. Pastures close to villages were doubly pressurized, on the one hand by the gathering of *teresken* and on the other hand by the intensified activities of livestock (Domeisen, 2002).

The development of the protected area network

The system of protected areas that was established under Soviet ruling could not prevent or limit the harmful impact of people on the natural environment. The existing reserves in the Pamirs were not linked together. They were not respected by local land users or international business men and not protected by the authorities and thus degenerated to paper parks (NABU, 2002).

All the same the protected areas of the Pamirs survived the breakdown of the USSR. As figure 6.2 illustrates, the total area of protected areas was able to increase even during the difficult situation after independence. Furthermore, the existing protected areas were not changed in status in order to exploit their resources without hindrance by new companies as in many other protected areas of the CIS (Krever et al., 1998).

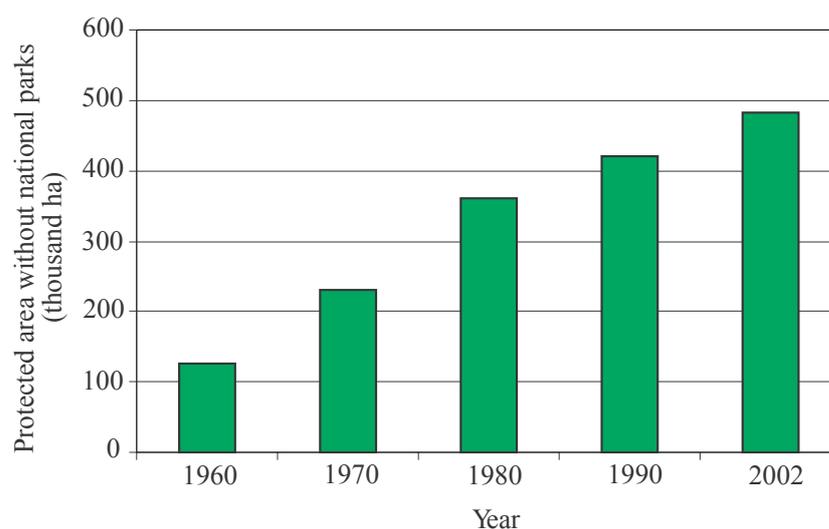


Figure 6.2: The expansion of the protected area network of Tajikistan between 1960 and 2002. Included are all categories of protected areas except the national parks. Until 2002 only the Shirkent National Park and the Tajik National Park were established (Novikov and Safarov, 2003a, Tajik Ministry of Nature Protection).

The impact of the civil war on the Pamir National Park

While the pre-independence policies were favourable for activities related to nature conservation, independence itself affected them controversially. In 1992 the Ministry of Nature Protection was authorized by the Tajik government to pursue administrative agreements with the various *rayony* that were included in the area of the planned Pamir National Park. However, these works, as well as all other work being undertaken for the implementation of the protected area, were abruptly stopped when the unrests that followed independence turned into a civil war in 1992. Due to these incidents the delineation of the final borders of the Pamir National Park as well as the management plan were never completed (Cunha, 1993) and the first national park within the Tajik Pamirs remained unrealised.

6.2.4 New attempts to create a national park in the Pamirs

In 2001, when the Tajik Republic celebrated 10 years of independence, the Tajik government identified the protected areas of the Pamirs as unsatisfactory in its State of the Environment Report. The initiative to realize a mountain national park in the Pamirs was resumed for the third time, now called Tajik National Park. All discussions about the further proceeding of the park based on the first concept worked out for the Pamir National Park (see above).

Despite the new efforts to realise this project, members from the Academy of Science and the Ministry of Nature Protection were confronted with numerous difficulties. New instruments for park management were discussed among different authorities. However, experiences with westerly stamped concepts were strongly limited after 70 years of Soviet ruling and possibilities of comparison were hardly found within the region⁵. Moreover, it was doubtful if it would be possible, or make sense, to engraft an alien concept to the TNP that did not take into account the Soviet past. These struggles were added to by the consequences of the civil war, namely by lacking money to pay salaries, buy equipment, work out a sound management plan, by competition among different departments and by the disinterest of local people. As a consequence, the Tajik National Park consisted a roughly outlined border only. Zones were not specified and a concrete concept or management plan were not yet prepared or implemented. Therefore the TNP remained a paper park until today (NABU, 2002). The actual state of the TNP in 2002 is described in more detail in chapter 8.

6.2.5 International attention

During the Soviet era, the only international ecological organisation that was active in Central Asia was the Socio-Ecological Union. It established a Biodiversity Conservation Centre that has been active in the provision of information on protected areas (Danilina, 1996). It is still present today, focusing on the promotion of eco-tourism and environmental education and on the establishment of a national park system.

After the breakdown of the USSR, activities to increase awareness of protected areas among the public were intensified within international programmes. Resulting a seminar funded by GEF on environmental education, an 'International Association of *Zapovedniky*' has been set up to exchange information among different protected areas within the former republics of the USSR (Danilina, 1996).

Only after the civil war, international environmental agencies who were already active in the neighbouring countries expanded their activities to Tajikistan. At the end of the 1990s the Tajik Republic joined and ratified a number of important international agreements as listed in appendix E.

⁵The first national park of Tajikistan was established in the Shirkent valley (west of Dushanbe) with international attention in 1991. Severe environmental problems occurred in this region that were resulting in intense erosion. Intense herding of livestock led to overgrazed pastures and forced the collapse of special grassland ecosystems. This situation was addressed with the creation of the Shirkent National Park. The tasks of the first national park of Tajikistan were to manage the number of livestock and to foster alternative sources for income generation with tourism (Weber, 2003).

Chapter 7

The landscape ecosystems and actor categories within the TNP

The analysis of the different states of the TNP focuses on the characterisation of resource use within its area. The use of resources includes the consumptive use of resources and their conservation as elements of the land use system. This system is a result of the interactions between different actor categories with various ecosystems.

This chapter outlines the landscape ecosystems and actor categories that are characterised within the sphere of the TNP as illustrated in figure 2.3 on page 11.

The chosen procedure follows the structure of the first component of a SDA as explained in chapter 5. Section 7.1 gives an overview about the landscape ecosystems with respect to natural and cultural boundaries. The second section focuses on the characterisation of relevant actor categories in terms of their use of space and resources, their organisational power, and their power in the decision-making process. The actual state of interaction between the ecosystems and the different actor categories focusing on the use and conservation of resources will be described in chapter 9.

7.1 Landscape ecosystems of the Tajik National Park

The ecosystems as illustrated in figure 7.1 represent the basic conditions for the land use system. The single elements of the landscape are first characterised within the three selected study areas. In a second step an estimation about the formation of ecosystems within the whole park area is given. Since especially the area of the TNP outside the GBAO could not be visited within the field period and most available studies focus on the GBAO alone, the information given may not be fully applied to the north-western corner of the park (Dzhirgatal and Tavildara region).

7.1.1 Bio-physical units within the TNP

Physically the TNP is fully located inside the mountain area of the Pamirs. The bigger part of the TNP spreads over high mountain area and is thus covered by ice, rocks, and steep slopes. Lower areas situated in valleys of the Western Pamirs are only partially included into the park. A third physical unit are the vast elevated plains included in the eastern part of the park. This characterisation points out that the bio-physical units of the TNP are not only distributed on different altitudes, but further differ concerning their exposition and relief. As a consequence of the multitude of these elements, a wide range of different ecosystems are present within the park which constitute the base for a multitude of possible utilisations. In the following they are only roughly characterised.

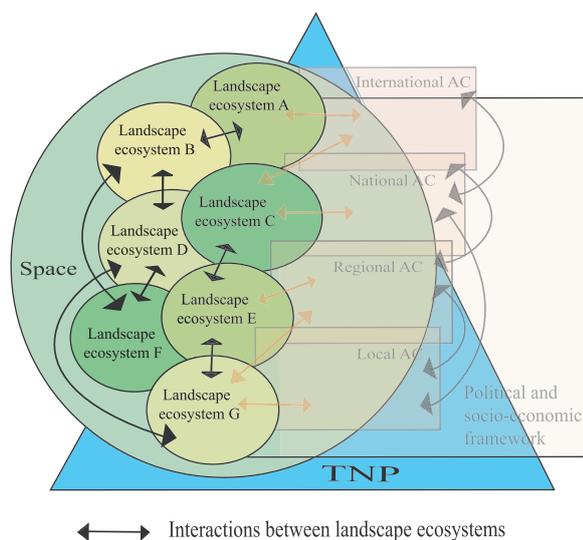


Figure 7.1: Model of landscape ecosystems within the TNP (according to figure 2.3).

Table 7.1 gives an overview about the ration of different bio-physical units within the three selected study areas.

Table 7.1: Land cover within the three selected study areas inside the TNP (based on mapping inside the study areas, 2002).

Bio-physical units	Kokuybel		Muzkol		Yashilkul		Total	
	Area (ha)	(%)	Area (ha)	(%)	Area (ha)	(%)	Area (ha)	(%)
Grassland	20,446	55.5	25,460	45.7	8,747	37.5	54,654	47.2
Forest	0	0	1,463	2.6	0	0	1,463	1.2
Cultivated land	0	0	671	1.2	0	0	671	0.6
Lakes	169	0.5	0	0	843	3.6	1,011	0.9
Barren land	16,230	44.0	28,096	50.5	13,727	58.9	58,053	50.1
Total area	36,845	100	55,690	100	23,317	100	115,852	100

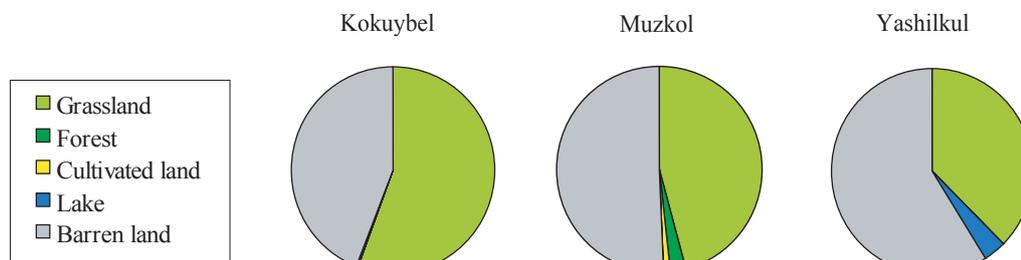


Figure 7.2: The ratio of the different bio-physical units within the study areas (based on table 7.1).

Grassland

Most area of the TNP is located above the tree line, thus the main vegetation type is grassland. It covers an area of 54,654 ha (47.2%) within the study area. Grassland

is composed of various species and may be attributed to different plant communities which include cushion plants and woody sub-shrubs (cf. table 3.1). According to IUCN, the Pamirs belong to the main centres of plant diversity within the former USSR (1992, p. 71).

However, due to intensified human use only little grassland is still in a natural state and the diversity is at risk. Almost all grassland within the study area is used as permanent or fallow pasture or hay field. Namely irrigated meadows and swampy meadows but also wild meadows are used for hay-production. Especially pastures and hay fields close to winter settlements are heavily grazed by livestock. About 13% of the grassland within the three study areas is seriously overused.

Furthermore, damage to grassland is caused by intensive collection of sub-shrubs, such as *teresken* and *Artemisia* species. This is done in all three study areas, but most intensely in Kokuybel and Yashilkul where no forest exists. The result is a reduction in winter fodder and increasing erosion and degradation.

The vast grassland of the Pamirs is the natural habitat of ungulates such as the Marco Polo sheep and the Asiatic ibex. The degradation of grassland areas restricts their range which is already impacted by hunting activities, boundary fences and settlements.

Almost half of the study area is covered by grassland. This is assessed as representative for the Pamirs. However, due to the location of the TNP around the vast glaciated areas of the Pamirs the ratio of grassland within the park has to be estimated as less than 50%.

The use of pastures, hay fields and woody sub-shrubs is described in more detail in chapter 9.

Forests and bushland

In the whole study area, only 1,463 ha (1.2%) are covered with forests or bushland. Forests are only located in the lower areas along the river Tanymas in Muzkol area up to an altitude of 3,400 m a.s.l. Woody vegetation is mainly found in river plains and referred to as small-leaf forests. They are composed of *Betula*, *Salix* and *Populus* species. These forest stands are often accompanied by *Hippophae rhamnoides*, *Rosa* and *Tamarix* species. Along rivers and on slopes up to 3,500 m a.s.l. *Juniper* species grow on rocky ground. Forests in this altitude are mainly made up of few single trees surrounded by dense bush vegetation (cf. figure 7.4). Small-leaf forests and juniper vegetation build a source of firewood and construction wood



Figure 7.3: Grassland along the river Kokuybel close to Aktash. Already in late August vegetation becomes brown (Photo: A. Haslinger, September 2001).



Figure 7.4: Sea buckthorn along the river Tanymas (Photo: A. Haslinger, September 2001).

and are intensely cut especially near settlements but also in remote areas. There is no reforestation inside the study area.

The forest area in the Pamirs is small and extremely patchy. According to oral information from T. Hoeck, at the end of the 1990s about 10,000 ha of forest existed in the whole GBAO (based on interview data from Hoeck with the *Tadjikles*, 2003). This area however is not only composed of dense forest, but also includes bush land that contain single trees. Many such forests are in close distant to villages which are not included into the TNP. Thus the inclusion of forests into the TNP is difficult. Most of it is located in the very north-western part of the park.

Cultivated land



Figure 7.5: A distinct border between cultivated (watered) and barren land is typical in the Pamirs (Photo: H. Kreuzmann, September 2002).

Cultivated land is defined as land used for crop cultivation, including fields and small vegetable gardens around the houses. Not included are areas used for livestock breeding since they are counted as grassland. Within the study area only 0.6% are cultivated. The 671 ha are all located in the upper Bartang valley between Pasor and Khudara (Muzkol) in close distant to rivers and on flat areas. They are located in an altitude of 3,000 m a.s.l. Wheat, barley, oats, peas and potatoes are the main crops.

According to Aknazarov (1999), 13% of the Pamirs are suitable for pasture or agriculture. Only about 3% of this area is used for agriculture. Breu and Hurni (2003) suggest that the arable land in the Western Pamirs only accounts for approximately 0.4% of the

total area of the GBAO. Due to the fact that the TNP hardly includes any populated valley of the Western Pamirs, the ratio of agricultural land may not exceed 0.05%.

A more detailed discussion of agriculture will follow in chapter 9.

Rivers and Lakes

The rivers Muksu and Obikhingou source within the TNP. The Muksu river is fed by the melt waters of the Fedchenko glacier and meet the Surkhab river northeast of Dzhirgatal. The latter merge with the Obikhingou river and build the Vaksh river, which is the second largest river of Tajikistan¹. The Murghab river coming from the Eastern Pamirs merge with the Bartang river west of lake Sarez and then flows into the Pandzh.

In the eastern part of the park, rivers are often not perennial and dry up in late summer, thus limit the stay on the pastures for herders. Also in winter some springs dry up and force people to get the water from greater distances. Water fetching is mainly done by women. In contrast to livestock wildlife is reported to be not dependent on runny water since they can eat snow instead.

Surface runoff is high on sparsely covered slopes and scree. Even though precipitation is low, intense rainfall sometimes occur, causing mudflows and wash away thin soil layers. The water discharge is maximal when snow and glacier melt is most intensive in July and August. In the western valleys flooded rivers often cut off remote settlements.

¹From the place the Vaksh merge with the Pandzh river it is called Amu Darya.

Major lakes of the Pamirs are enclosed in the TNP, such as lake Karakul (38,000 ha), lake Sarez (8,500 ha), lake Yashilkul (4,800 ha) and lake Bulunkul (340 ha). The surface area of these lakes make up 2% of the TNP (2003). The major lakes are situated in an altitude between 3,250 m a.s.l. (lake Sarez) and 3,800 m a.s.l. (lake Karakul).

Rivers and lakes and their shores are important wildlife habitat for fishes, waterfowl and migratory birds, such as the Indian goose (Mountain goose) (*Anser indicus*) and the Tibetan snow cock (*Tetraogallus tibetanus tibetanus*).

Barren land

Barren land consists of areas with no or very little vegetation, such as glaciers, rocks of moraines and dry scree.

The TNP encloses the most glaciated region of the Pamirs, including the largest glacier outside the arctic regions, Fedchenko glacier. It stretches east of the Academy of Science ridges from south to north and reaches a length of 70 km. Mountain glaciers cover about 6% of the area of Tajikistan and accumulate 456.9 km^3 of water, building a very important water resources for Tajikistan as well as the other Central Asian lowlands.

Due to a rise in temperature and a change in precipitation, glaciers are retreating. According to the Tajik Met Service Fedchenko glacier lost about 1 km of its lengths and 2 km^3 of its volume between 1933 and 1990 (Novikov and Safarov, 2003c). Smaller glaciers in the western part of the TNP are reported to retreat relatively fast and retrieve between 10 and 600 meters per year. Glaciers in the eastern part of the park are often small and retrieve slower (2 to 10 m yearly) (Tajik Met Service, 2003).

Glaciers and barren land are only sparsely inhabited by wildlife. Bigger mammals only use this area for retreat during hot summer days or when disturbed on lower located grazing grounds.

Within the study area, 50.1% of the area is covered with barren land. Glaciers only account for a small area, while the bigger part is made up of rocks and scree located on different altitudes. With respect to the huge glaciated area and the high altitude within the TNP, more than half of its area are assessed to be covered by barren land.

7.1.2 Socio-cultural units within the TNP

Administrative boundaries

The main part the TNP is located in the GBAO. Only its north-western corner spans an area with no *oblast*-level administrative division (historical regions of Vahio and Karategin). *Oblasty* are divided into *rayony*, districts. The TNP covers the six districts Murgab, Shugnan, Rushan, Vanj, Komsolobad and Dzhirgatal (clockwise). The border of the TNP frequently runs along these districts as well as along the state



Figure 7.6: The wide river bed of the Tanymas (Photo: A. Haslinger, September 2001).



Figure 7.7: View from a rock glacier to the western slope in Khavrastara valley. Sparse vegetation only grows on the scree in lower altitude (Photo: H. Kreutzmann, September 2002).

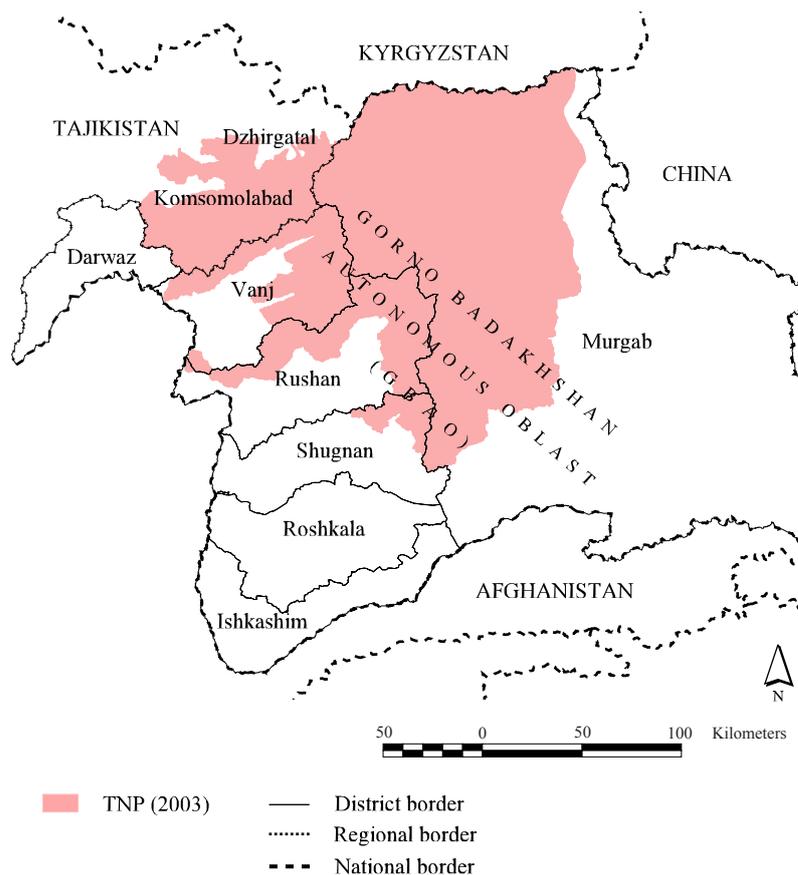


Figure 7.8: State, province, and district boundaries within the sphere of the TNP (TNP according to TNP, 2003).

borderline (cf. figure 7.8). These districts are split into numerous municipalities (*jemoats*). The three selected study areas belong to the following *jemoats*: Kokuybel is part of Karakul *jemoat*, Muzkol area belong to Savnob *jemoat*, and Yashilkul is split between Alichur *jemoat* (Murgab district) and Vankala *jemoat* (Shugnan district).

Patterns of utilisation

The total area of the TNP was undetermined for a long time. This caused a huge number of varying data according its area, as is shown in appendix D. In the following and when not further specified the TNP always corresponds to the park area as mapped in 2003.

The TNP is not yet split into zones which will specify the use of resources, such as recreational areas, trekking areas, strictly protected zones, etc. Therefore the different patterns of utilisation inside the park may not yet be marked off. However, at the moment the areas used in a productive manner all time (pastures, forests, hunting areas) intersect with the newly established protected area.

Protected areas inside the TNP are formed by the sanctuaries Pamir, Sangvor and Muzkol which were established during the Soviet past. The Pamir sanctuary was not clearly demarcated and thus it's boundaries may not be the same on all maps. It was partially used as hunting ground even during the Soviet era, respectively as pasture area.

As discussed above, most grassland within the TNP is used as pasture area. Some of this area is managed by farmer associations or state farms. Farmer associations are registered as private corporation of herders and run independent from the state. State farms still manage the livestock collected within the former *sovkhozy*.

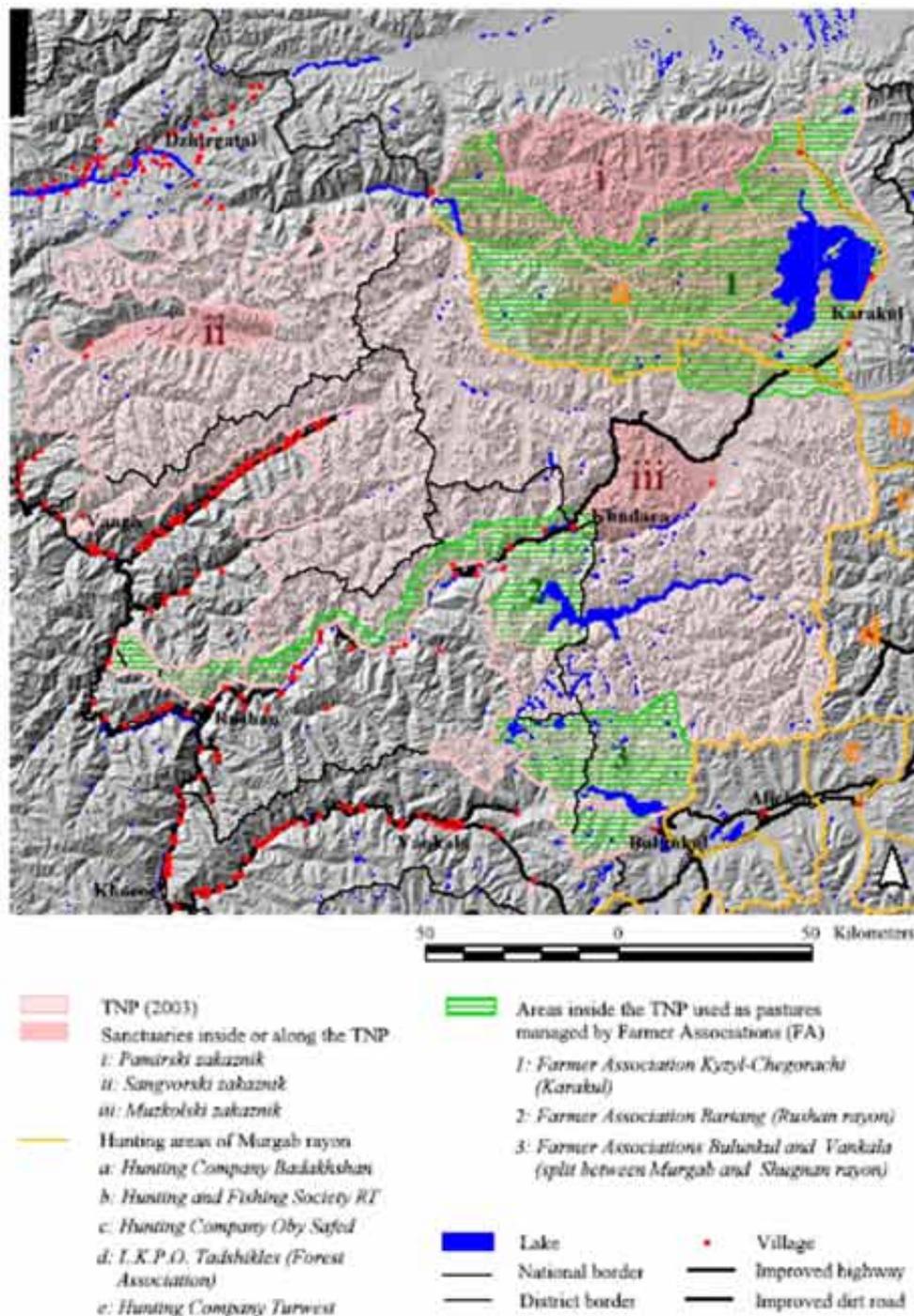


Figure 7.9: Land use patterns inside the TNP in 2003 (Data source: DTM derived from Russian topographic map series 1:200,000 by CDE; TNP according to TNP, 2003; sanctuaries according to Badenkov and Buzurukov, 1992 and TNP, 2002; farmer associations according to ACTED, 2002 and TNP, 2002; hunting areas according to ACTED, 2002).

Both institutions assign pastures to the herders, whereby the decisions of farmer associations often only concern hay fields and winter pastures. However, pastures are also used in areas not managed by a special institutions and not all area allocated to a farmer association or a state farm are still in use². Therefore the hatched area is not congruent with the pasture area (cf. figure 7.9).

²According to information of different herders, the pastures around Beljandkük valley are not in use anymore since they are too remote.

Agriculture makes up a very small area in the upper Bartang valley and is not separately shown in figure 7.9.

Another consumptive use of resources within the TNP is hunting. This kind of resource use encases all other patterns of utilisation and is combined with pasture use, wood collection, and tourism. Hunting takes place in almost the whole park area and affects Marco Polo sheep, Asiatic ibex, marmots, hares, *ulars*, but also snow leopards and different waterfowl. Official hunting grounds of state institutions and private companies for trophy hunting are only marked off in Murgab district. One of these hunting grounds is located inside the TNP. However, several other hunting areas border the TNP directly since there is no buffer area around the park. State institutions, namely Nature Protection Committees, have to supervise the activities within all hunting grounds.

Cultural boundary



Figure 7.10: The high pasture in Gokdzhar is used by a Pamiri family. Pamiri people live in tents or stone-huts, but only seldom in yurts (Photo: A. Haslinger, September 2001).

As described in chapter 3, the Pamir Mountains are culturally split in two main parts. This invisible line is running through the TNP, or in other words, the TNP unites the two parts inhabited by Pamiri and Kyrgyz people. Local names often clarify the affiliation of the area to one part, but there are also regions where valleys, rivers and lakes are named bilingual and both cultures mix within a certain range.

The pastures in Kokdzhar and especially the one around Dzhilgakul are assessed as very remote. In some regions residents clearly localise this kind of boundary, in others not: In Summa, for example, people seemed to determine very consciously what belongs to their sphere of influence. A Kyrgyz herder living on the south side of the river Alichur explained that this side of the river

belongs to the Kyrgyz, the other side of the river belongs to the Shugni. Thus Kyrgyz people don't use the pastures on the north side of lake Yashilkul. Even though the boundary of Murgab *rayon* is located about 15 km further in the west, this man was sure that Kyrgyz herders from Murgab *rayon* should not go opposite the river. With his statement this actor points out that not the district lines on the map are crucial for the spatial formation but the local circumstances and perceptions, influenced by history and culture. Other local people confirmed this statement. A visit to the opposite area made clear that these high pastures are only used by herders from Shugnan, but not by Kyrgyz people.

In the northern area between the river Tanymas and lake Karakul, people did not mention the presence of such a separating line. They only mentioned the cultural affiliation of their neighbours in connection with statements concerning trading goods, because Kyrgyz and Tajiks are handling different goods.

Concluding remarks

The TNP (2003) makes up a great deal of the Tajik Pamirs and covers 25,917 km^2 of its area. The **area of the TNP** encloses a sufficient size to maintain ecological processes. However, the borders of the park don't encompass the natural ecosystems intended for protection. Since most part of the park spans high mountain area, the

main bio-physical units inside the TNP are grassland and barren land. Other bio-physical units that are inhabited by numerous species of flora and fauna, such as forests and cultivated land, are only marginally included. This gives rise to the assumption that areas with a high diversity in ecosystems and species richness are not adequately included into the TNP.

The TNP spans six districts in two provinces and borders the Chinese and the Kyrgyz frontiers. Most permanently inhabited settlements are excluded from the park. All the same a good portion of the TNP is used according to various **land use systems**. Pasture farming constitutes the main pattern of utilisation. Only parts of these pasture lands are managed by farmer associations or state farms, while the remaining area is not managed by an institution and used individually. Three existing protected areas are included in the TNP. Two of them (Sangvor and Muzkol sanctuaries) make up the core zones of protection within the park where resource use and other human impacts are not allowed. However, the TNP as well as the protected areas inside the TNP are overlapped by hunting areas of private companies. Furthermore, the eastern part of the park is bordered by numerous hunting areas without any buffer belt.



Figure 7.11: Kyrgyz summer pasture with the typical yurt (Photo: A. Haslinger, August 2001).

This disordered side by side and **mix of different patterns of utilisation** that are not compatible inside and along the TNP are a heritage of the Soviet Union but were further aggravated by the unclear institutional organisation after the collapse of the USSR. Under Soviet ruling, different patterns of utilisation were spatially separated. However, since certain ministries were authorised with interacting tasks, constricting patterns of utilisation overlapped in some landscape ecosystems. Later on, new land use systems were introduced without any adaptation to existing forms of land use. Hunting areas of private companies merged with protected areas, impeding effective conservation of species and ecosystems. Today, changes of the land use patterns and their spatial separation are discussed from the TNP authority. However, *zones of the TNP* are not yet defined and the different utilisations are so far not allocated to specific zones. From this it follows that the patterns of utilisation inside the TNP do not differ from those outside.

The TNP unites mountain areas inhabited by different cultures. The **cultural boundary** between the Pamiri and the Kyrgyz is not visual but dependent on individual perceptions. These culturally shaped perceptions may be crucial for the acceptance of other man-made boundaries in this area, in particular the one of the TNP.

7.2 Main actor categories within the scope of the TNP

This section gives a characterisation of the main actor categories related to the TNP according to the model shown in figure 7.12.

The actor categories are defined after their use of space and handling of resources. For a further characterisation, their organisational power and the power in the sense-making process concerning the TNP is taken into consideration.

The various actor categories are active on different scales which do not only refer to spatial extensions but also differ in scope as illustrated in figure 7.13. Resource

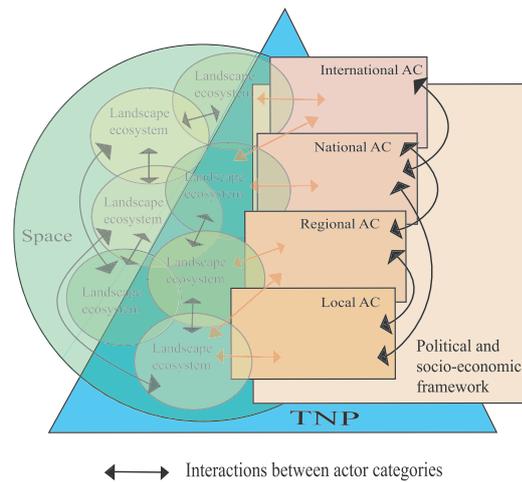


Figure 7.12: Model of actor categories on different intervention levels within the TNP (according to figure 2.3).

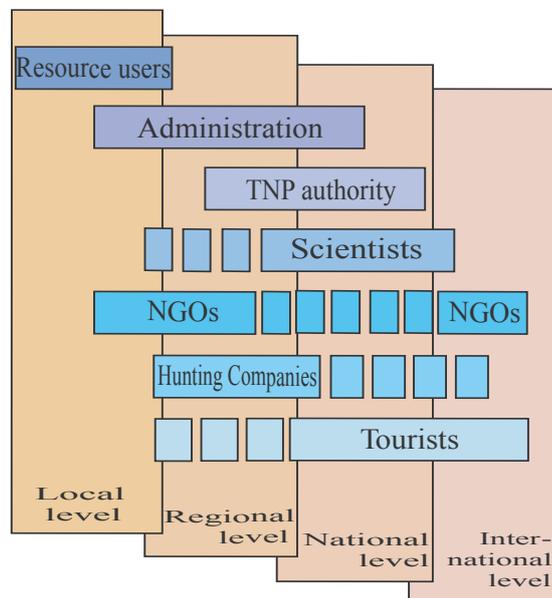


Figure 7.13: Administrative levels and the scopes of the different actor categories related to the TNP. The scope extend to the levels on which the interests of an actor category can be realised (own illustration).

users are acting on the local level and can claim their interests only on this level. The TNP authority is active on the regional and national level, but they cannot directly assert their interests on the local level (this is done via the legislation). Hunting companies are mainly active on the regional level, but due to their close cooperation with various international hunting agencies they may act as an influencing category on higher levels. Tourists constitute a special actor category since they may be organised as groups on an international level or travel as single persons, thus their scope varies.

7.2.1 Local resource users

Local resource users form the biggest actor category in the context of the TNP. Beside residents of the TNP also local people living outside its boundaries use the natural resources inside the park, therefore the number of this actor category cannot

be specified in detail. There are nine settlements with about 1,054 households (5,301 inhabitants) located inside the park. The park boundary runs close along intensely inhabited valleys. Within a distance of 4 km from the TNP boundary exist 46 villages with 2,499 households (15,157 inhabitants)³. These people enter the TNP daily or temporally. Due to the mobility of pasture use in this area, the number of people living inside the park area is changing seasonal. In summer, more people live inside the park than during winter, since many herders using summer pastures inside the park live in *kishtoo* and *kishlaks* outside the park in winter.

Local people who live inside the TNP use the same natural resources than people living outside its boundaries, such as pastures for herding, meadows for hay making, woody sub-shrubs and wood as fuel, and wildlife as source of meat. The best access to these resources is often given on remote high pastures since these areas are not visited by rangers who control the use of resources or by residents of villages who gather resources for their own consumption respectively to sell them on the bazaar. These conditions are only present on remote high pastures and restricted to the summer month. During winter, the access to resources is the same for almost all people. Only those who could gather *teresken* and *tizak* around the *jailoos* in summer and bring parts of it down to the winter house are better off than those people who have no means to go to a high pasture during summer. The latter are dependent on the fuel sold on the bazaar all the year round, as members of this actor category stated.

Local resource users may be divided into different sub-categories. The main sub-category are the herders. Most herders carry out their job only seasonally. In winter they often live outside the park and hold down different jobs which are not always connected with livestock breeding. Herders are engaged in taking care of livestock such as yak, sheep, and goats. Livestock is of own property or belongs to related persons or state farms (*gozkhoz*). The work with livestock is often split among genders. Men are responsible for herding and bringing back livestock in the evening, while women work is related to the treatment of the animals as soon as they are brought back to the *jailoo*. They tie up yaks, milk animals and process their products to *ayran*, *may*, *sarmay*, *kurut*, *kaymak* and felt.

Since herders represent the main actor sub-category that lives at least part-time inside the TNP, they are most directly affected by the establishment of the park. However, since they are not actively involved in the decision-making process they cannot bring in their interests. These may also not be represented by the farmer association, the *gozkhoz* or the *hukumat* since these institutions are neither occupying an active role in the planning process of the TNP. Most herders are not informed about the TNP at all.

Another sub-category are the local hunters. They may not be as clearly circumscribed as the herders since hunting is only a part time activity and done by many different people. Activities related to the use of resources are hunting, fishing, collecting of wood, woody sub-shrubs and medical plants may not be clearly attributed to one sub-category. Other people belonging to this actor group are local residents who practise jobs in the village, such as teachers and merchants. Unlike the herders and hunters, they enter the TNP only on and off.

Statements of members of this actor category mainly focus on the ecosystem of grassland (Kokuybel, Yashilkul), agricultural areas and forests (Muzkol) and lakes and rivers (Yashilkul) on a local scale.

7.2.2 Administration

This actor category contains people working for different institutions from the local and regional level, such as Nature Protection and Land Use Committees, *gozkhozy*,

³Data based on village survey done by AKF-MSDSP, census information 1999/2000.

and *hukumats*. The connecting element between these institutions is their dealing with issues of nature conservation and management of natural resources. Since it includes people working on different levels, it makes up one of the biggest actor categories.

The local administration comprises farmer associations and the *gozkhozy*. They allocate the pastures and hay plots to the herders and thus take an active part in the management of natural resources. Additionally, the *gozkhozy* also market the animals that are not of private property. The next higher level is built by the *jemoats*. They are subordinated to the *hukumats* that coordinate the work on the regional level (*rayon*). They are working in close relationship with the regional committees of the state departments and coordinate all work that is not directly delegated to these committees. The Nature Protection and Land Use Committees and the Forest Offices are mostly made up of two to four employees. They are subordinated to the respective agencies on the *oblast* level (regional authorities), located in Khorog, which are themselves subordinated to the headquarters in Dushanbe. In cooperation with the *humkumats*, these local committees have to manage and control the use of natural resources inside and outside protected areas, analyse their condition, supervise their use and inform the state bodies about their work as well as suggest quotas of hunting licences (WWF 2002). In addition, they also have to coordinate research work related to natural resources. The three to four men working for Nature Protection Committee in Murgab *rayon* are in charge of many different tasks, but due to a lack of coordination, finances, training, and material they are not really able to fulfil them. Thus, their scope is limited to a minimum, as one employee explained. A member of the actor category 'international organisations' stressed that as a legacy from the Soviet era, the administration still constitutes a strong machine and the several institutions and their employees are not willing to dispense their power, thus complicate any reorganisation.

Members of the regional departments have the possibility to actively take part in the establishment of the TNP, while members of the local authorities often only get a passive part and have to execute what was decided on the upper levels of administration. Some members of the local authority thus complained that they are not actively involved into the planning process of the TNP, while at the same time other members of this actor category admitted to be glad to delegate this duty to others.

Statements of this actor category mainly refer to the socio-cultural units such as *jemoats* and *rayony* as well as to the existing protected areas, but not exactly to the TNP itself.

7.2.3 TNP authority

The members of the TNP authority constitute the smallest actor category. According to the information of one employee of the TNP, about 30 people were employed by the TNP in summer 2002, most of them working in the headquarter in Dushanbe. They are the only actors who are directly employed by the TNP. Their task is to collect basic data about the area of the TNP, to set up the field offices and engage new staff. The most urgent work is the design of a management concept and the search for investors and funds.

Many of the employees were working for the Ministry of Nature Protection or the Academy of Science in former time. Only one person is responsible for the area of the park located within GBAO in the field, and no local people are engaged as guard by the park at the moment. The regional offices are not established and thus the work in the field is still delegated to the staff of the local Nature Protection Committees. Due to a lack of finances, trained and updated staff as well as cooperation among the different stakeholders, the TNP authority cannot fulfil all tasks, as a member of

this actor category stated.

The park authority is working with the TNP most directly, but all the same this is not the sole decision making party. The duty of the park authority is to coordinate all aspects of the planning process among the different local authorities, regional departments, NGOs, the Academy of Science and other scientific institutions, the government and international agencies.

Notes of this actor category focus on the whole area of the TNP. However, since the boundary of the park was not decided yet at the time of the field campaign, many statements also focus on the GBAO in general.

7.2.4 Scientists

The first input to establish the TNP came from national scientists. Until today the Tajik Academy of Science located in Dushanbe always played an active part in the planning process, while the institutions of the regional level were not really included. According to a statement of an employee of the Academy of Science, they are commissioned with different tasks concerning the compilation of basic data about flora and fauna and the elaboration of a reasonable course of the borderline.

Due to intense research work done during the Soviet era in the field of natural sciences, the Tajik Academy of Science harbours a lot of basic information concerning the natural environment of the TNP. However, the breakdown of the Soviet Union caused a limitation of the activities of the Academy of Science. Many qualified researchers went to Moscow or St. Petersburg or left their profession, money for teaching material, equipment and salaries were cut, and systematic research was not realisable any more, as an employee complained. Some studies on vegetation and wildlife of the Soviet era are now out of date or stored with the Russian Academy of Science in Moscow or St. Petersburg and thus not easily available for the Tajik researchers and for the TNP.

At the same time the Academy of Science started to suffer from shorted support of the Government, the international community turned it's attention to Central Asia. Foreign research restarted in Tajikistan only after the breakdown of the Soviet Union. At this moment, the foreign basis of information about the Tajik Pamirs dated back to the beginning of the 20st century when many German and British expeditions took part in this area. Until these days different research projects, mostly European, were carried out in the region. They focused on the state of the natural environment, the economy, regional cooperation and on the impact of the process of transformation to the livelihood of different communities.

Since the international researchers are often closely linked with development agencies, they represent a financially strong group that may influence the establishment of the TNP very effective.

Statements of this actor category are in the following often separated to the national and international scientists. Comments of national scientists mainly focused on their specific research topic, namely on flora or fauna. Therefore their information refers to the bio-physical units of grassland, agricultural areas and forests included into *zakazniki* which serve as undisturbed research areas. Statements of international scientists mostly refer to the well known areas along the Pamir highway and may not be allocated to a specific landscape ecosystem.

7.2.5 National and international organisations

This actor category includes employees of non-governmental organisations of Tajikistan and from abroad as well as international development agencies that are implementing projects related to ecological issues within the Pamirs.

During the last years, several international organisations started with projects focusing on environmental matters within the Pamirs, namely the Aga Khan Planning and Building Services (a project of the Aga Khan Foundation), UNESCO, the French NGO ACTED and others. ACTED became active in the Eastern Pamirs in 1999 with the Pamiri High Mountain Integrated Project (PHIP). Their interests focus on the improvement of infrastructure and livestock yields, fostering of cultural identity and saving of health care (ACTED, 2000).

The international organisations are informed about the TNP from international conferences and contacts to scientific institutions. However, since their access to scientific work conducted under Soviet ruling is limited, their information base is rather small, as a member of an international NGO stated.

At the same time the state, scientific and academic agencies suffered from the economic crisis, a trend towards the development of environmental NGOs was increasing. National and even regional NGOs were established since independence. In 2002 about 30 NGOs existed in Tajikistan. NGOs are often assisted by foreign financial support. This allows them to supplement and sometimes even replace defunct state structures. However, also national NGOs are suffering of a lack of finances and thus they depend on international support, as an employee of a national NGO explained. According to Krever et al. (1998), many environmental NGOs are made up of highly educated staff, usually with a scientific background. Many national NGOs conduct research projects and organise summer training courses to sensitise children and teenagers for ecology (Novikov and Safarov, 2003b). Others are engaged in the collection and documentation of information about different spheres of interest, such as hot springs, archaeology or other sightseeing or are active in scientific monitoring activities.

Maybe due to the fact that no NGO is focusing solely on the TNP, national as well as international NGOs are marginally represented in the planning process of the TNP. However, attempts are made by the TNP authority to improve the participation of the international organisations mainly in terms of financing.

Since the interviewed members of this actor group were mostly employees of international NGOs that are active in close relation with the local population, their statements have to be assessed as a representation of the interests of local people as well.

Members of this actor category focused their statements on different spheres within the scope of their action. Employees of ACTED thus refer to the Eastern Pamirs while most employees of AKF focused their statements on the Western Pamirs. Other international development agencies hardly assigned their statements to specific landscape ecosystems but refer to the GBAO or even the whole Tajik Pamirs.

7.2.6 Tour operators

Tourism in the Pamirs, mainly in the eastern part, is mostly organised by national or international hunting companies and focus on trophy hunting of Marco Polo sheep. Thus hunting companies represent the main tour operator in the Eastern Pamirs. According to the information of the chief of a hunting company, only few other animal species such as Siberian ibex are hunted by few customers. Hunting companies are linked with Russian or US hunting agencies who recruit the customers. They are well organised and are able to serve their clients with all kind of services. Hunting companies dispose of means to improve the infrastructure they need to enact their business and are not dependent on investments in infrastructure done by the state or NGOs.

The biggest hunting company in Murgab area employs 42 people during the hunting season. The permanent staff is made up by 24 people, more than half of it

are locals, the others are recruited from Khorog or even Dushanbe, as the chief of this company explained. According to information from Nature Protection Committee, hunting companies have their clearly dedicated hunting area and are only allowed to hunt as much animals as they are able to buy licences for. However, this law is not always satisfied, as own observations clarified.

There is only one hunting company active inside the TNP and until 2002 it was running the business without any restrictions. The managers of this hunting company are not included into the planning process of the TNP. However, due to their financial position and close links to national agencies that are dealing with the handling of licences and nature conservation, hunting companies in general may assert their interests within these institutions not only concerning the establishment of the TNP, but also concerning other tasks of nature conservation. This assessment was given by members of NGOs as well as by a former employee of a state authority.

Other promoters of tourism are rare and concentrated to Dushanbe and Khorog. The state tourism agency *Intourist* suffers from a lack of money and does not offer trips to the TNP, as an employee of an NGO explained. In the 1990s a private tourism enterprise named Badakhshan Tours was established in Khorog, but since there are only few tourists booking a tour with them, an employee of a tourist company stressed that they can hardly live on this business. Local people and private companies working in the tourism industry have no means to establish needed infrastructure and like they outlined they are dependent on investments made by the state or NGOs in the road network and other basic needs to promote tourism. Even though this sub-category consists of few actors that are not actively involved into the TNP, their interests focusing on economic development may be supported by international agencies, giving their interests in the development of the TNP more importance.

In 2002, ACTED started a tourism project within an initiative of UNESCO in the Eastern Pamirs that was briefly outlined by an employee. Since this NGO is attached to the actor category of international organisations and their project focusing on tourism was only on the way to be implemented in summer 2002, it is not described in more detail here. However, it is to mention that NGOs investing in tourism development may become important for local people as well as for the environment and thus the TNP in the future.

Statements of members of this actor category who are active in the hunting business focus on the landscape ecosystems of their hunting areas which mainly span grassland and barren land. Hunting areas sometimes overlap parts of *zakazniky*. Information from other tour operators mainly focuses on specific spots that are assessed as important for their business, such as hot springs and archaeological features. These spots are not always located within the TNP. Since only few information was got from other tour operators, most of the following statements of this actor category focus on the sub-category of hunting companies.

7.2.7 Tourists

This actor category includes all sort of tourists from the national to the international level, that visit the Pamirs for different interests. They are divided into three sub-categories.

One sub-category are national tourists. They mainly visit health spas that are located all over the Pamirs, as an employee of an NGO explained. Inside the TNP however there are only few spas, thus health tourism inside the park is not existing. A special group of tourists is made up by Tajik people who out-migrated to the lowlands or left the country and now come back from time to time to visit their relatives or to see Prince Karim Aga Khan, spiritual leader of the Shia Ismaili Muslims (Sieber, 2002).

Only few foreign tourists visited the Pamirs since the end of the civil unrests in 1997, official numbers are not available. During the two stays in the area not more than about 10 tourists visited the Eastern Pamirs per summer season (hunting tourists are not included here), in the Western Pamirs there may have been a little more. Until today it is not easy to reach the Pamir Mountains due to their remoteness but also due to administrative obstacles. Therefore the number of tourists is not looking to increase much in the close future. A bigger part of foreign tourists is made up by employees of international organisations based in Dushanbe or other Central Asian states.

The motive of tourists to visit this area is often found in the numerous legends that made and make the Pamirs to a mystic place for foreign people. Many reports from tradesmen such as Marco Polo, scientists as Sven Hedin and George Curzon, and mountaineering expeditions reported about this unknown place and culture already some hundred years ago and contributed much to the legends around the Pamirs, its nature and its culture (see Polo, 1982; Hedin, 1899; Curzon, 1896; Rickmers-Rickmers, 1930). According to an employee of an NGO, the inaccessibility of this region for foreigners during the Soviet time contributed much to its actual attractiveness. The area got accessible again only after the collapse of the Soviet Union and for a long time the Pamir Mountains were regarded as one of the last frontiers in the world. Since it is still not easy to reach this area today, it may keep its image as a white spot on the map for some time, as an employee of an international NGO stated.

Only few tourists book a tour with a local or national tourist agency, most prefer to travel the Pamirs on their own. A member of an international organisation explained that tourists stay in the area between 5 to about 14 days. Due to the missing infrastructure tourists often bring all their equipment with them and thus local people may obtain little profit from this kind of tourism.

Adventurers often pass the Tajik Pamirs on the Pamir highway. Only few of them leave the road to go trekking or sightseeing⁴. This bases on several reasons: the information such tourists have about the area is very small and often not updated. Furthermore, tourists are often short in time. Backpackers are travelling on their own and there are no local tourist guides or organised trekking available. Since only few tourists speak Russian, their ability in conversation is limited. A foreign tourist explained that he would like to go for a hike but he cannot inform himself about trekking routes with locals.

Nature in general and the culture are both objects for sightseeing. These two places of interest are spatially separated and are hardly combined in the Pamirs, as statements of travellers outlined. Demands in nature are often higher distinct than interests in culture and are met along the highway, while interests in culture focus very strong on handicrafts and are satisfied in the centres. Since nature is only observed from the highway, none of the tourists saw a Marco Polo sheep or an ibex. One tourist stated that it would be nice to see such animals but that he has no time to make an extra safari. However, it seems that this does not reduce the impression of the area. The spatial attribution of culture and nature to different areas leads to a typical picture the tourists create from the Pamirs: the landscape is regarded as something very impressive and primal. It is not seen as antroposphere, but as natural habitat, and often tourists can hardly imagine how people can live in this so called desert. This is understandable facing the fact that they have never seen the green and lush meadows of high pastures in early summer or fat livestock on a *jailoo*.

A special sub-category of tourists are the trophy hunters. With about 60 visitors

⁴During the field campaign no trekker or mountaineers were met, thus their perception is not known. According to the information from NGOs and state departments, foreign mountain expeditions to the highest peaks of the Tajik Pamirs are relatively popular.

per season they constitute most members of this actor category in the Eastern Pamirs. Hunters, including both men and women, mostly come from the USA, Mexico, Europe and Australia. Some of them visit the area regularly to shoot mainly Marco Polo sheep or Asiatic ibex, others only come once to get their trophy. Trophy hunters stay in the area only for a couple of days, as soon as they shot the trophy they leave the Pamirs without taking time for sightseeing activities or other activities in the region. Hunters mentioned that they are only interested in their hunting trip and in the trophy animal. They stated to be fascinated by the majestic appearance of the king of sheep, the *arkhar*, while everything else is of low interest.

In contrast to backpackers, trophy hunters don't have to organise their trip on their own. They told to inform themselves about providers of hunting trips on the internet and then book a trip. Since they are guided to the places where a lot of Marco Polo sheep can be seen, they create a totally different picture of the Pamirs than the backpackers: they regard the Pamirs as an oasis of good fodder but with harsh conditions. The mountains harbour wonderful and plenty of wild animals that are in competition with the local people living in this same environment. No hunter stated to be aware that local people are not allowed to shoot Marco Polo sheep.

Tourists are not directly represented in the planning process of the TNP. However, especially international hunting is a very lucrative business and thus its providers are one of the most influential people on the local as well as on the regional level, representing their own and the interests of their customers via their relations to national and international agencies.

None of the interviewed tourists have been inside the TNP, they are not informed about it. Therefore statements of this actor category mainly focus on bio-physical units within the areas they visited, which are located along the Pamir highway (travellers) or around a hunting camp (trophy hunters). All information of tourist refer to selective spots and may not be assigned to the whole area of a certain landscape ecosystem.

Concluding remarks

As illustrated in figure 7.14, the identified actor categories all focus on various aspects of the land use system and thus affect and interact with different landscape ecosystems included into the TNP.

Only two actor categories are in direct contact with natural resources. The actor category '**local resource users**' focuses on a variety of natural resources, while the sub-category '**hunting tourists**' only focuses on trophy animals. Both categories are not involved in the decision-making and planning process of the TNP. However, the tourists constitute a financially strong actor category and thus they may claim their interests via hard currency. Local resource users have a great effect on natural resources and the environment of the TNP, but their responsibility for the area is only important in terms of space, but not in terms of power of decision.

The use of landscape ecosystems by **other actor categories** is much more limited to specific areas but does not cover the whole TNP. Even though they deal with natural resources in a general manner, this does not implicate their participation in the planning process of the TNP.

Hunting companies and **NGOs** take in a special position in the management of resources. In many cases they are in a better financial situation than national institutions, thus they take over some of the state duties, such as monitoring and survey of certain species. This reallocation of duties brings about new actor categories in the management of resources, but until now they cannot convert their experience within the TNP.

Scientists occupy a specific function in this context since they are widely expected to provide the park authority with methods of resolution in terms of resource

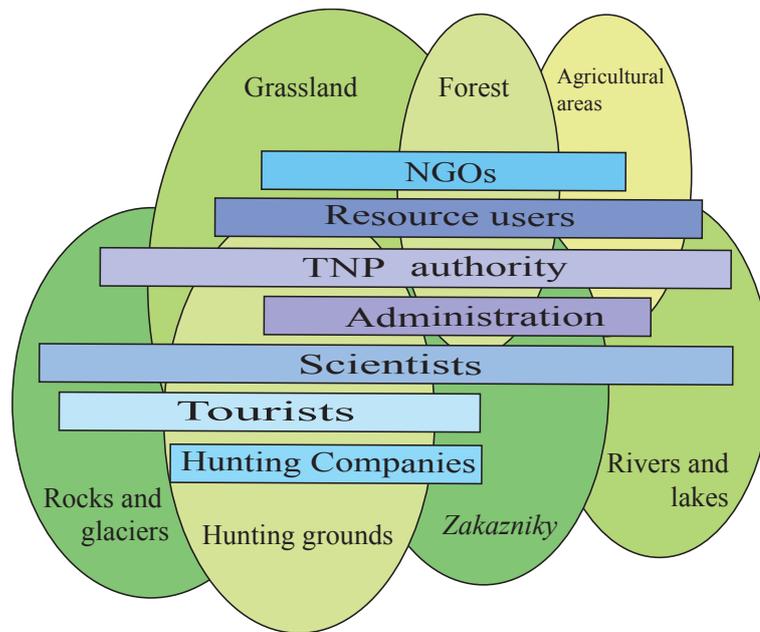


Figure 7.14: Actor categories and their spatial scope within the different landscape ecosystems. The different scales on which the actor categories are acting and the temporal factor are not illustrated (own illustration).

management and nature conservation. Regarding the lack of money and equipment as well as the partially outdated methods, national scientists can hardly implement applied research at the moment. Thus they don't provide the expected support for the TNP.

These remarks point out that the **functions within the land use system** are clearly allocated to and split between different actor categories. The use of resources is dominated by actor categories from the local and regional levels, while the conservation of resources is regulated by actor categories from the national and international levels. Only the actor category 'national and international organisations' provides structures to take part in and influence resource use and conservation on different administrative levels, as illustrated in figure 7.13.

Chapter 8

The target state of the Tajik National Park

At the beginning of every project stands the identification of its aims. The aims of the TNP have been discussed and worked out for more than 10 years now, and this process is not yet completed. Different interruptions, changes of the influencing conditions and newly involved actors all left their marks on the project. Therefore, within this thesis the target state of the TNP is not seen as definite or as declared by officially pre-set aims only, but as a vision about how the TNP should be in the future. As a base for further discussions concerning the process of its implementation, the thesis includes objectives as seen by different actor categories - no matter if they match with the official ones or not.

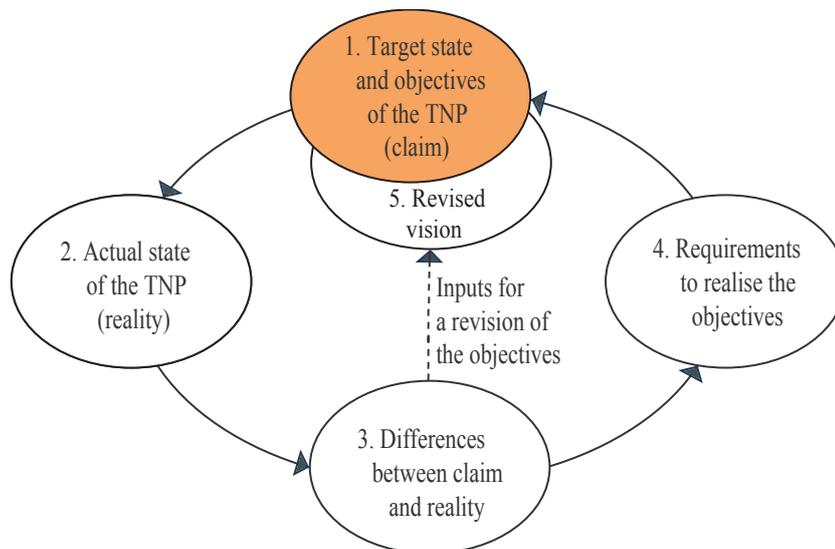


Figure 8.1: Step 1 - Assessment of the target state of the TNP (own illustration).

This chapter focuses on the target state of the TNP in a general manner as illustrated in figure 8.1. In section 8.1 the official aims of the TNP are outlined as communicated by the TNP authority. In addition, the views of different authorities concerning the way of how these aims should be realised (organisation and management) are described. The second section focuses on the interests of different actor categories about the future design of the TNP. The main emphasis is set on the notions and interests of local actor categories who are intensely interacting with the landscape ecosystems and thus the resources included in the TNP. These actor categories are the one concerned most by the establishment of the TNP. Statements of members of the authorities and scientist are also included if they differ from or specify the official goals of the TNP. In addition, needs not mentioned in direct

relation with the TNP are outlined since they are assessed as important influencing factors of the TNP. Section 8.3 finally gives an overview about the varieties between the notions concerning the objectives of the TNP as assessed by different actor categories.

8.1 The official objectives of the TNP

8.1.1 Pre-set aims of the contents

There is no official document available that enlists the latest aims of the TNP. Thus the objectives of the TNP are outlined according to verbal information gained during interviews with members of the TNP authority. However, the explanations of the single members of the TNP authority diverged in some points.

The official objectives of the TNP focus on three different spheres that are all in close relationship. Some of the aims related to conservation, economic development, and research may conflict with each other, but others can only be realised because the existence of others. Since the planning of the TNP already takes a long time, the detailed aims of the TNP were revised several times and were adapted to new circumstances, ideas and knowledge.

Conservation

The preservation of unique and various ecosystems, flora, and fauna species of the regions of the Pamir Mountains is named as first priority of the TNP.

Rare and endangered fauna species listed in the Red Data Book of the Republic of Tajikistan, such as the Tien-Shan brown bear (*Ursus arctos isabellinus*), the Central Asian otter (*Lutra lutra seistanica*), the Turkestan lynx (*Felis lynx isabellina Blyth*), the snow leopard (*Uncia uncia*), the Marco Polo sheep (*Ovis ommon polii Blyth*) the Black stork (*Ciconia nigra*), the Indian goose (*Anser indicus*) and the Golden eagle (*Aquila chrysaetus*) should be protected within the frame of the TNP. However, the goal of the park is not only to protect rare species, but to contribute to the conservation of all fauna and flora native to the region of the Pamirs to preserve the gene pool of this mountain area.

Furthermore, objects of outstanding geological and scenic value such as mountain peaks and the huge mountain lakes as well as whole ecosystems should be conserved.

Conservation objects do not only focus on nature elements. Historic monuments such as ruins and *mazars* from the era of the Great Silk Road are present within the TNP and should be maintained. Cultural objects and local traditions, in particular the mobile lifestyle of the residents in the eastern part of the park, serve as a basis for sustainable use of resources and for tourism development and should therefore be abet.

Economic Development

Economic aims mainly focus on the development of tourism since this form of activity is regarded as compatible with the issues of conservation. Various activities should be fostered to attract not only foreign tourists, but also Tajiks and people living in the neighbouring lowlands to enjoy recreational opportunities within the TNP. The promotion of tourism should give new options for income generation for local people. At the same time tourism should finance the TNP and thus the promotion of conservation issues. Tourism within the TNP should be regulated and controlled, so that this activity has no negative impact on any other aims of the TNP focusing on conservation.

The provision of recreation activities is aimed to be combined with public environmental education.

Furthermore, the TNP focuses on the promotion of a rational use of natural resources. This expression is a legacy from the Soviet era but does more and more pass into what is described by sustainable use of resources. However, the term 'rational' is still conceived wide. The promotion of traditional methods of land use as well as the development of new sources of energy, handicraft industry, and other ways of economic activities that may improve the living conditions of the population are all associated with it. In order that such activities do not affect conservation aims in a negative manner, they will only be implemented in special zones inside the TNP.

Research

Similar to protected areas under Soviet ruling, the TNP constitutes an important experimental ground for all kind of future research work, mainly in the field of natural sciences. The huge protected area will allow to study natural processes in an undisturbed environment that will contribute to the understanding of flora and fauna. Research findings should guarantee the solving of practical questions of biology, geology, geography, economics and other sciences concerning reproduction of flora and fauna, their potential and sustainable use, environmental monitoring and nature conservation. Furthermore, historical resources inside the TNP should be analysed and documented to support the promotion of tourism.

Potential assistance for the park management is mentioned to include studies about botany, landscape, natural resources, dynamics of natural processes and monitoring of park areas.

8.1.2 The TNP as an instrument to manage conservation

This subsection specifies the ideas and notions about how the above enlisted aims of the TNP shall be officially realised. The comments mainly focus on statements of the TNP authority concerning strategies of conservation.

Strategies focusing on development issues and research are only mentioned in relation with conservation. Additional comments of employees of the Academy of Science, the Land Use Department, and the Ministry of Nature Protection are also considered because these are the institutions that are deciding about the further proceedings and implementation of the TNP.

Since parts of the described strategies are already implemented but others still remain theoretical, the following remarks are all kept in the present. They describe the situation as it shall be without revealing the present situation as it really is. A differentiation between this target state and the actual state can only be attained with a consultation with chapters 7 and 9.

Management category

The management plan and the concept concerning the structures of the TNP are worked out by different ministries responsible for natural resources, the TNP authority, the Academy of Science and with the contribution of land users, local governing authorities as well as tourist agencies and public organisations and are confirmed by the Tajik Government. The concept building the frame for all action within the TNP complies with one of the protected area management categories of IUCN. For a deeper embedding into international standards, to develop new markets, and for the promotion of tourism the park is registered as World Heritage Site.

Funding of nature conservation within the TNP

Basic financing is made available by the state, the *oblasty*, the *rayony* and the *jemoats* whose territories are within the TNP.

A significant contribution for the financing of the TNP is coming from the international community, such as conservation agencies, states or private investors. International money also comes from the trophy hunting business inside the park. Hunting companies have to hand over 30% from their revenue to the TNP¹. Also the income from hunting licences flows into the budget of the TNP. However, this money is used for nature conservation issues in general and is not reserved for the TNP only.

Tax and other incomes reserved for the TNP comes in from other sorts of tourism, such as mountain hiking and climbing, spa tourism, and pilgrimage. Every visitor of the TNP has to pay a park fee which varies according to the activity that is carried out and the area of the park that is visited. Mountaineers who visit areas between 3,000 and 6,000 m a.s.l. have to pay 50 US\$, for altitudes higher up 100 US\$ per stay. In general, tourists have to pay 1 US\$ per day. These fees are used for the realisation and maintenance of the TNP but not for salaries of its employees since these are paid by the state.

Organisational structures and cooperation

The organisation of the TNP bases on three hierarchical layers. The base is built by local people that are salaried to control the use of resources inside the park. In each region about 10 residents are working for the TNP. They live inside the park area and thus are on site all the time. These residents are allowed to use the natural resources inside the park in a sustainable manner while taking care that no other residents abuse them. Local and regional institutions such as the *jemoats*, *rayony*, the Committees of Nature Protection and Land Use, the Farmer Associations, and the Forest Agencies form the central block within the TNP. Each *rayon* has an own regional park office² from which the work of the employees of the base is coordinated. All work carried out within the TNP concerning conservation, economic issues and research is coordinated and supervised by the main TNP authority located in Dushanbe, building the top of the organisational pyramid. The authority gets advice from the Ministry of Nature Protection, the Academy of Science, the Land Use Department, the Forest Association and other state institutions. This administration is embedded into a network that links all protected areas of Tajikistan and may even be extended to cooperate the activities focusing on nature conservation in all Central Asia.

The planning process of the TNP is dominated by national and international actor categories such as the TNP authority, the Ministry of Nature Protection, the Academy of Science, the Land Use Department, the Forest Association and different NGOs. However, they take into consideration the needs and interests of actors from the regional and local level that are represented by the *jemoats*. Gradually the main focus of the organisation runs down from the upper part of the pyramid to the base. The maintenance of the established park is more and more delegated to institutions on the regional and local level.

To guarantee the exchange of information and an ongoing assistance for the TNP, participation of different actor categories focus on all levels of administration. Coordination among the different actor categories is fostered on the long term. The exchange of information between the different levels of administration is warranted

¹Since it is not yet clear if the hunting company inside the TNP will be assigned to a special zone or if it has to be excluded from the TNP, this statement resides vague.

²These regional offices are located in Khorog, Rushan, Vanch, Altyn Mazar (Dzhirgatal) and Murgab.

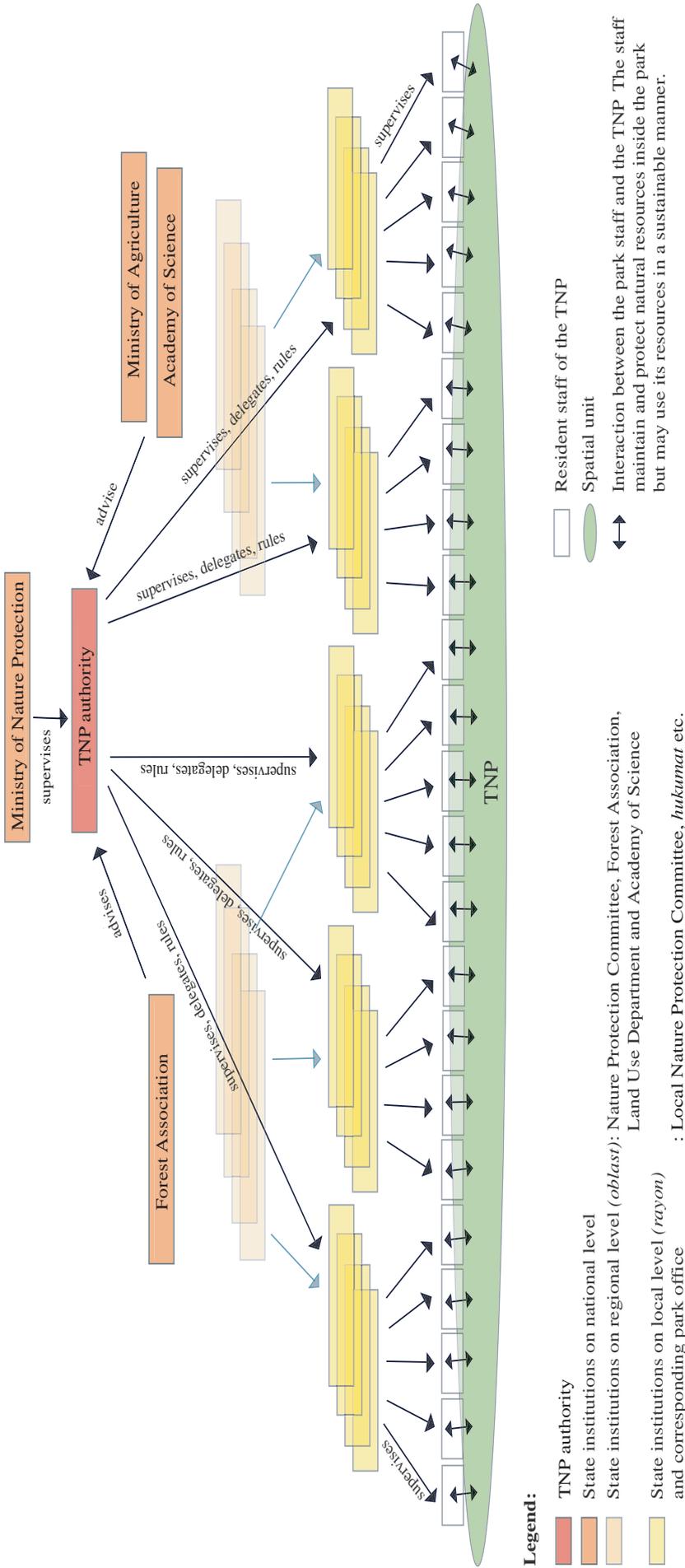


Figure 8.2: Proposed organigram of the TNP. The TNP authority acts as a coordinating superior institution but delegates the tasks concerning management of resources and science to institutions located on the regional and local levels which correspond to the national level. The institutions on the regional level are illustrated transparently since their role is not proper defined, however, they supervise the institutions on the local level. The resident people working for the TNP are the only employees that are in direct contact with the park area. They control the conservation of resources within the park and may use these resources for own purposes in a moderate manner (based on interview data 2002, own assessment).

by the regional offices and the *jemoats*. Since the project of the TNP brings together many different institutions, cooperation among them is fostered and their tasks and duties are defined clearly.

The staff of the TNP is enlarged rapidly and contains 210 employees in 2005. Residents working for the TNP have to live inside the park, while people interested in a job within the park authority need to fulfil certain criteria such as having a certificate from university, endue a lot of experience and know the area of the TNP very well.

8.1.3 Management of natural resources within the TNP

The area included into the TNP is selected by the Academy of Science and includes locations with rich or rare flora species as well as important habitats of several wildlife species. Clarification on site is regulated by the Land Use Department in collaboration with the relevant *jemoats*. The course of the border line depends on the settlements, the value of recreational matters, biodiversity dispersal, the need for protective measures and the pristine state of the environment. In general, infrastructure such as roads and hydro power plants are not included into the park. Especially in the Eastern Pamirs, permanent populated areas are strictly excluded from the park. Only few areas located below 3,000 m a.s.l. are rated to be unspoiled so that they are worth to be conserved and included into the TNP. Borders are marked with special signs so that residents as well as other people exactly know when they enter the park area. Nevertheless, borders are not thought to be fix and may be adapted to new circumstances in the future.

Several zones that are defined by a special working group divide the huge area of the TNP. Each zone features a different degree of permitted use and postulated conservation, ranging from strict protection to zones where different economic activities are allowed. Areas that contain a lot of vulnerable species have a high priority and are excluded from any use. The two *zakazniky* Muzkol and Sangvor build the core zones of the TNP where no human activities are allowed. Zones for hunting, tourism, use of pastures, and conservation are differed. In some areas the use of pastures is forbidden. Remote pastures for example that were not in use after independence are prevented from any further use. 70% of the park area is generally not accessible for the public. Several zones however may be accessible with a special permission or during a certain period. Zones aiming at the conservation of certain wildlife species for example are prevented from disturbances during the mating and breeding period, but may serve as base for wildlife observations during the rest of the year. As the park border, the separation of zones is handled flexible.

No new laws are enacted for the area of the TNP, but the existing ones are enforced with the help of better controls. All the same, human activities within the several zones of the park are regulated by special legal positions which are only in force for a bordered area.

In general, the use of pastures is regulated by the Resolution on state ecological programme from 1997. When not specified, the pastures inside the park are used according to this resolution. In several zones however, the use of pastures is only allowed under certain conditions. Restricting measures are the limitation of the number of animals and of the time spent on the high pasture. On such pastures herders are prohibited to protect livestock with dogs and to hold guns. Several remote pastures that are not grazed anymore or that are prevent from grazing provide fodder and undisturbed habitat for wildlife.

Strict regulations are introduced inside the park concerning all activities that are related to the cutting of wood and digging of woody sub-shrubs. Wood cutting and collection of *teresken* are forbidden and may only be permitted in special cases for planted trees. Increased controls guarantee that there is no abuse. The few forest

stands that are included into the TNP are well conserved but not expanded by forestation. At the same time, the substitution of woody biomass energy is fostered with investments in alternative sources of energy, renewably or fossil-based.

Regulations of hunting activities inside the TNP are strict. Hunting is only allowed with a hunting licence, during hunting seasons, in specially defined zones and on certain game species. From this it follows that hunting may be also allowed to resident people - as long as they may organise a licence. The role of the international hunting company who is active inside the park however is controversial. The TNP authority deliberates about to allow hunting in a special zone or to prevent international hunting business inside the TNP. Since trophy hunting is one form of tourism and thus constitutes an aim of the TNP, it is argued that this activity cannot be completely excluded from the park. Investigations in sustainable use of wildlife resources provide local actor categories with a major share of the profits.

To ensure that nature conservation issues can be realised, the regional economy is involved into the park project. Tourism, as the most prominent economic activity, is promoted in all administrative units of the TNP. Tourism does not only constitute incentives for local actors to invest in conservation issues, but also makes up important funds for the TNP budget. Different offers such as hunting, trekking, wildlife safari, health resorts and cultural workshops attract international as well as national customers. Investigations in infrastructure and guided activities guarantee that tourists only spread punctual and not area-wide and thus do not get into conflict with conservation measures. Areas critical for wildlife are protected from any disturbing activities during the reproduction period but may be visited for observation during the rest of the time. Due to an expanded road network³ the access to several sightseeing and to remote areas is eased, so that travelling of tourists as well as the controls of activities through the park staff are simplified.

The activities realised inside the TNP concerning nature conservation positively affect regional development in areas outside the park and thus build an impulse for the whole region of the Pamirs. The TNP is not only creating jobs in administration and field staff in a direct way, but local people also get the opportunity to find work in the economy that is increasing in relation to the TNP.

Concluding remarks

The **aims of the TNP** are many-sided and formulated in a general manner. As a consequence, the initial position of the TNP is very blurry. The aims are not assessed with priorities and thus the TNP cannot be attributed to a certain management category. The promotion of tourism for example is once mentioned as primary goal of the TNP while another interviewee of the same actor category assess the conservation of natural resources as the primary aim. This handling gives the impression that the goals of the TNP are rated different among the members of the TNP authority and that goals are unequally communicated opposite different stakeholders to motivate them for this project⁴. The consideration of objectives outside nature conservation signalise a willingness of the different authorities to invest in a combination of conservation with regional economic development and thus to realise the conservation of natural resources according to new concepts. However, the description of the official priorities points out that the goals in the sphere 'conservation' mainly focus on strict conservation, while the goal of rational use of resources is assigned to the

³New roads are constructed from Vanch valley to Fedosenko glacier, three different routes from Batshor (Gunt valley) to lake Sarez and the Bartang valley, and a loop road from Roshorv (Bartang valley) to lake Sarez. The dirt road linking lake Karakul – Muzkol – Tanymas – Bartang is reconstructed.

⁴Opposite foreign people the TNP is presented as project to conserve nature. Members of the local authorities and local people, however, are told that the priority of the TNP focuses on economic improvement of the area.

sphere of 'economic development'. This example as well as the enlisted goals in the sphere 'research' clarify that the TNP is understood with respect to Soviet concepts of nature. Research does not focus on new and interdisciplinary projects including social sciences but is directed to traditional spheres of natural sciences.

The target state of the **organisational structures of the TNP** is very vague but roughly focuses on a community-based approach for conservation. However, even though the interviewees explained that different actor categories such as international organisations and private companies are included into the planning process and management of the TNP, their future role was never defined. Furthermore, the links between the different institutions on the three administrative levels as well as the cooperation of institutions located on the same level are not further specified. Even though the use and conservation of wildlife is assessed as important issue within the TNP, the decisive role of private hunting companies as well as the relation to resident people are not recognised and attended.

Similar to the organisational structures, the future task-sharing in the **management of resources within the park** is not specified. The ideas about the management of natural resources mostly focus on wildlife resources. The interviewees are not aware that hunting is not compatible with the category II (national park) of the IUCN classification scheme of protected area. Furthermore, the different zones are not specified and no interviewee mentioned the importance of a buffer area around the park with respect to the adjacent hunting areas along its eastern border.

Despite the **indistinct information** concerning the target state of the TNP, respectively the implementation of its goals, it is worth mentioning that members of the TNP authority and employees of various state institutions may have definite ideas about the objectives and management of the TNP but do not like to present them to foreign people in a comprehensively and binding manner.

8.2 Objectives of the TNP as seen by different actor categories

The following section focuses on objectives of the TNP as assessed by the different actor categories. Since many actors are only badly informed about the TNP, the formulated aims are not focusing on the spheres of the officially outlined objectives, but on expectations the actors have regarding this huge project. These views circumscribe notions about the future development of the TNP and options for the TNP as seen by various actor categories which express their interests toward the TNP.

Local resource users, employees of different authorities and tourists could not discuss their notions in bigger groups, while especially members of the park authority, scientists, and employees of international organisations were able to exchange their ideas within several meetings and workshops. Therefore, especially the remarks concerning the interests of local resource users may not be declared as complete or balanced. However, since only few members of the actor categories 'international organisations', 'tour operators' and 'tourists' were interviewed, their statements may not be generalised for the whole actor categories but represent personal views of the interviewees.

8.2.1 Local resource users

Improve the access to and supply with natural resources

People who live inside the park or use the high pastures inside its territory formulated their interests that the scope for action should not become limited since they need

free access to different natural resources like high pastures, meadows, wood and woody sub-shrubs, and wildlife to cover their daily needs.

In connection with the TNP few local people mentioned that the infrastructure should be improved for the promotion of tourism. This would facilitate the access to high pastures for local people. The access to remote pastures is seen as important to prevent pastures around villages from overstocking and to provide the own livestock with good fodder.

In the western part of the TNP people expressed their interest in a better access to wood and cultivating land. As a man from Pasor explained, some of their fields are located 30 km away from the village and since there is no bridge existing, they cannot take any shortcut to reach them. With the establishment of the TNP this infrastructure is expected to be improved.

Improve the conservation of forests and *teresken* sites

People from Khudara stated that the forest around their village is decreasing fast and that they worry to run out of this resource. Some villagers mentioned that the conservation of the remaining forests should be increased. People from the eastern part stated that it is important to prevent people from the villages to collect *teresken* on high pastures since this cause erosion and a decline of fodder for livestock. Within the TNP the existing laws to protect these resources should be better enforced than today. However, many members of this actor category link this objective with the demand of getting support in form of alternative sources of energy from the state as during Soviet era.

Rearrange wildlife conservation and increase the Marco Polo sheep population

A local man from Alichur, where poaching is told to be very intensive, stated that the TNP should hurry up to be established since otherwise no Marco Polo sheep will be left. Many people living inside the TNP formulated the wish that international hunting as well as intensive poaching by other actor categories should be forbidden within the park. Hunting companies who are running their business outside the TNP should be forced to deliver part of their income to finance the TNP as well as other protected areas. Marco Polo sheep should not be conserved by enacting new laws that will confine their sphere of action, but by the segregation of a certain area within the animals are well guarded. Within this area Marco Polo sheep will then increase in numbers and may spread over neighbouring areas, where they can be hunted by tourists as well as residents to a certain extent. Rangers should control the conservation of this protected area and any poacher who is caught there should be fined. Rangers should be well educated, equipped and paid, otherwise they would shoot wildlife for their own consumption or to sell it on the bazaar, as a man from Khudara explained. With this measures the number of Marco Polo sheep is mentioned to increase within the next three to four years.

A man who works part time as hunting guide and is told to hunt a lot for Marco Polo sheep mentioned that the whole TNP should be reserved for wildlife. Therefore the TNP should include good habitats for Marco Polo sheep where they can increase in numbers. To provide them with optimal conditions, no livestock and herders should be allowed inside the territory of the TNP. Herders who use the pastures within the TNP until today should therefore be provided with new pastures outside the park by the TNP authority. This is seen as unproblematic by this actor since there is much less livestock in this area than during Soviet time.

However, for local hunters it is not only important to conserve wildlife as a natural resource, even more they stated that it is important to be allowed to use

wildlife as a renewable resource. They stated that they should get the chance to hunt for wildlife legally. As a man from Pasor explained, rangers should be informed about the actual numbers of Marco Polo sheep that are left and thus be able to calculate the shooting quota offered for local people without harming the whole population.

Another interest of local people related to wildlife management focuses on the numbers of wolves. Resident people explained that they wish to get a gun to decimate wolves on their high pastures and to protect their livestock from them or that staff of Nature Protection Committee should do this job as in former time. Some herders explained that this measure would also be of great importance for the welfare of the population of Marco Polo sheep.

Improve job opportunities outside the farming sector

A man working part time for a hunting company stated that what counts for local people is the provision of jobs, and not the conservation of nature itself. However, only few local people formulated visions concerning options provided by the TNP to increase their livelihood. They explained to be interested in the promotion of tourism which could offer new jobs which are mostly seen in guiding and leasing of transport animals.

Bring in own interests in the management of resources

According to the statement of a local man, people will understand and support the project of the TNP as soon as they are well informed about the TNP and its options for income generation as well as they can bring in their own interests. Therefore the TNP has to include local people into the planning process and the establishment has to be coordinated with the interests of people living inside and along its territory.

8.2.2 Administration

Improve own financial situation and equipment

Visions of employees of the local and regional offices of state institutions such as Nature Protection and Land Use Committees and the Forest Association focus on many different aspects that are all put in relation to the TNP. In general they expect an increase in investments in nature conservation issues that may improve their financial situation. This would allow them to improve their infrastructure and technical instruments. An employee of the Land Use Committee mentioned that especially maps are needed so that they may use them for reports and in the field.

Employees of the *rayony* and *jemoats* sometimes mentioned that they hope to diversify their local economy by incomes derived from tourism and thus would not be so dependent on means from agriculture any more. However, especially institutions of the Eastern Pamirs fear the TNP as a competitor for pasture areas that are very important for the local economy.

Enhance nature conservation

Nature conservation is seen as important with respect to *teresken* and wildlife such as Marco Polo sheep. One employee of a Nature Protection Committee stated that for a better protection of flora and fauna within the TNP all areas that are used as pastures should be excluded from the park. Another actor working for Land Use Committee highlighted the importance to protect Marco Polo sheep from poaching. Similar to the aims formulated by the park authority, the statements of members of this actor category concerning measures in nature conservation were rather vague.

Enable participation

Only one actor of this category stated that it is important to include local people into the planning and implementation process of the TNP and that also local people need an active chance to take profit from its establishment.

8.2.3 TNP authority

Generally, the statements of the members of this actor category correspond with the official aims of the TNP. The following remarks focus on personal visions of several members of this actor category that specify certain official objectives of the TNP.

Motivate resident people for nature conservation

Most members of the park authority stated that they are aware that the establishment of the TNP strongly depends on the motivation of local people. An employee of the TNP identified the stimulation of the interests of local people for conservation of wildlife as main point. This should be reached with the implementation of different measures so that local people can take profit out of this resource, for example by creating jobs for local people in tourism. Like this, local people would take care about this resources to save this source of income over a long time. However, such activities would need the support of international hunting companies which are not actively included into the management of the TNP (see previous section).

Promote tourism and international cooperation

The vision of the park authority mainly focuses on the diverse effects of an increased tourism. To guarantee its positive influence on the economy on village level up to the whole region and its support for the conservation of natural resources within the TNP, tourism should be realised in cooperation with foreign investors and institutions. The special interests and demands of tourists who visit the area should all be covered by the TNP. Therefore, the offers within the TNP should be unique and not be found in another region of Central Asia. As a member of the park authority explained, especially young people should be engaged in tourism since he attest them good language knowledge and an open mind.

Improve ecological education

The TNP should not only be reserved for foreign tourists, but may serve as example for the teaching of local people in nature conservation matters. Theoretical information could be converted in the TNP that serves as a kind of model area and thus may get comprehensible. This exchange and generation of knowledge should take place among different stakeholders and levels, ranging from local individuals to international organizations.

Improve exchange of information

A long term cooperation among different actor categories should be developed to improve long term assistance, access to and exchange of information. Especially scientific information created by the Academy of Science and foreign researchers should be made available and not stored throughout the former USSR. Therefore investments should be made in technical material such as computers and printers.

Exchange of information should be facilitated among mountain protected areas all over Central Asia to discuss similar management problems with other experts. Furthermore, the members of this actor category mentioned that since wildlife such as Marco Polo sheep migrate across the borders with the neighbouring countries,

efforts should be undertaken to protect their habitat in a transborder manner. This would need an improved cooperation and exchange of information among the environmental department of Afghanistan, China, Kyrgyzstan and Tajikistan.

Promote enforcement of laws

Interactions between different actor categories themselves and with their natural environment should be regulated by decrees and laws. Existing laws have to be enforced and where necessary, new ones have to be implemented. Local structures should be established within the park area to supervise these regulations.

8.2.4 Scientists

Enhance budget

National scientists expect that the realisation of the TNP will improve their position in terms of finances and equipment. This is seen as base to continue existing projects and implement new ones. The updating of the Red Data Book of the Tajik SSR for example is seen as urgent, but only financial support can promote this project.

Improve research opportunities and international cooperation

National scientists hope that the TNP will become famous and thus may attract researchers from abroad to carry out scientific projects within the TNP. That way the Pamir Mountains could get back their former position within international research, research stations will be established and cooperation with foreign scientists will guarantee that also Tajik scientist can realise their research projects.

Redefine the TNP borders and assess the zones

National scientist are interested in a good protection of the park area so that it will make up some kind of undisturbed high mountain environment to be attractive for all kind of research. The use of pastures inside the TNP should be allowed but controlled. However, the impact of local people living in and around the TNP should be reduced to a minimum.

International scientists wish that the TNP includes threatened ecosystems such as the small-leaf mountain forests and thus may contribute to their effective conservation. Beside small areas that are well protected they ask for large areas inside the park that may be used in a sustainable way to guarantee the livelihood of its inhabitants.

Create alternative sources of income

Particularly foreign researchers mentioned that for the TNP it will be crucial to make accessible also other sources for income generation that are situated outside the dominant farming sector. Mentionable are the dealing with products derived from medical plants, honey, dried fruits, nuts, semi-precious stones, and eco-tourism. Furthermore, interests of resident people have to be guaranteed by their active inclusion into the planning process of the TNP.

Redefine management category and increase cooperation

Some foreign scientists expressed their interest that the TNP will be declared as a biosphere reserve. This will link the protected area with the international community and thus foster an exchange in experience on a broader level. The TNP "could serve as an interesting transborder 'exercise field' for using and further developing

participatory methodologies and tools to promote SRM [Sustainable Resource Management] ... to be developed for the specific needs of protected areas. This could promote innovative action research, with collaboration between the ... nature conservation organisations, authorities at different levels, local populations, and specialised research institutions ..." (Maselli et al., 2003, p. 297).

An increase in cooperation is also demanded by the staff of the Academy of Science. As a member of this institution on the regional level explained, even though the Academy would really like to contribute to the implementation of the TNP, they will only do so as soon as they get a contract with the park authority. Otherwise they fear to be utilised as data supplier without getting any return service and without inclusion in the sharing of benefits of the park.

8.2.5 International Organisations

Combine wildlife conservation with sustainable use of resources

International NGOs stated that the main goal of the TNP should be the conservation of Marco Polo sheep together with the development of tourism with a strong engagement of local people. An employee of ACTED concretised that the TNP should start as a small project from which local people can directly profit. This will motivate local people for the park. Within this project, a widely respected natural resource such as the Marco Polo sheep has to be declared as a flagship species that stands as a symbol for nature conservation but also for a local resource of meat and may be used for income generation. This flagship species should be protected in some areas to let its population increase, then parts of it may be used as meat to substitute livestock as well as to market the remote area for tourism.

Therefore local people have to learn to deal with wildlife the same way as with livestock, meaning that they have to manage this resource very actively. This may be done with the set up of a Marco Polo farm where the wild sheep could be bred and harvested similar to domestic sheep.

Establish a zoning for the TNP

According to the vision of a member of this actor category, the TNP should be zoned as cycles standing for different degrees of conservation as realised within the concept of biosphere reserves. The core zone that stands for a strictly protected area should be chosen big enough that a certain population of Marco Polo sheep can survive in it. Within this core zone, no human activities should be allowed. The area around the core zone may be used by herders but contain a ban on hunting. The outer cycle should not be closed to enable the exchange of animals between different habitats and protected areas. Livestock will be tolerated in this area and in parts of this outer cycle local people should be allowed to hunt a certain number of animals that out-migrate from the core zone as soon as they are increasing in numbers.

Instruct local people as staff of protected areas

The protected area should be surveyed by well educated staff, thus the TNP has to select some local people for a training session as wildlife guard. These employees of the park should not only be well trained but also receive adequate equipment and salary.

Enhance cooperation among all stakeholders

Workshops within the frame of the TNP should be organised to bring all kind of people from different departments and levels of administration together. This will foster the dialog among the different stakeholders, strengthen connections among the

parties and lead to a better state of information since the stakeholders would then be forced to lay open their state of affairs. This pooling of different stakeholders is a difficult task and thus has to be done by an organisation that is well known and accepted by all categories.

Foster the development of tourism and coordinate tourism activities

Tourism is assessed as important to bring in new sources of income to the local level. However, there is a lot of training to do to guarantee a minimal standard. Offices should be established to coordinate the activities among the tourist operators, advise them in their work and manage the distribution of tourists in the area. No tourists should be allowed to travel where they want, they should first register in one of the offices. This is seen as important to reduce possible negative impact of tourism on local people and the environment.

8.2.6 Hunting companies and other tour operators

Improve wildlife management

Employees of hunting companies wish that the TNP will be able to influence their own business in a positive manner. They hope that the Marco Polo sheep population will be protected from poaching done by local people. Some members of this actor category even stated that herding should be forbidden in certain areas to get optimal conservation for ungulates. This would guarantee not only an increase in wildlife numbers but also an improvement of their condition, thus more trophy sized rams would be available. An owner of a hunting company outside the TNP explained that even though livestock and human presence have negative impact on wildlife, the use of pastures should not be restricted by new laws for local people but regulated in an improved manner.

Extend tourism

A man responsible for a hunting company mentioned that tourism should be increased and diversified in relation with the TNP. He stated that eco-tourism is not the only option for tourism in this area and that the potential for all kind of tourism activities is huge.

Improve infrastructure and access

People working for a tourist office are looking forward to the establishment of the TNP since they hope that it will improve their business. According to their vision, new roads should be constructed within the TNP to facilitate access to the park. Other infrastructure like hotels and an improved communication network should be installed in the centres located around the TNP, such as Khorog, Murgab, and Jirgatal. They are interested that the access is also becoming easier for foreigners in terms of administrative matters, meaning that entry formalities for the GBAO should be reduced. Members of this actor category are sure that once realised, the TNP will attract many clients from abroad since the Pamirs provides many different offers, such as hiking, spas, hunting and cultural sightseeing. One man even envisioned the establishment of a ski resort at the southern border of the TNP close to the Pamir Highway.

Mobilise international funds

The TNP is expected to attract international organisations and NGOs and thus to mobilise financial resources. Employees of hunting companies expect that these

funds are spent to protect Marco Polo sheep from poaching. However, according to a manager of a hunting company, the finances of international donors should be channelled via NGOs or directly to the park authority and not to the government since then risks are high that it will be spent otherwise. Furthermore, the TNP authority has to demonstrate to be able to manage financial resources in a proper manner. Transparency of cash flows is mentioned to be important for any financing of the TNP.

8.2.7 Foreign tourists

Simplify access and improve infrastructure

Tourists expect that the TNP will improve the infrastructure and thus simplify the access to this area. This is seen as important for any further promotion of tourism by most members of this actor category. Easy access to the area in this case does not only refer to an improved infrastructure but also on simplified administrative regulations.

Most backpackers see no need in an increase of organised trips offered by tourist agencies but have an interest in reasonable accommodation and information about the area such as road and hiking maps, sightseeing, translators, car rental, money change and restaurants to stand by. Many of these persons who travelled on their own highlighted the importance of free movement within the area, meaning in and outside the TNP.

Guarantee for trophy sized rams

Trophy hunters focused on other interests since they did not have to deal with any organisational matters concerning their trip. For them, most important is the availability of record sized or at least huge trophies.

8.2.8 Options not mentioned in relation with the TNP

The TNP cannot be regarded isolated from its surrounding, since different inter-relations connect it with the natural and socio-economic environment outside its borders. From this it follows that the TNP is not only dependent on interests of resident people concerning the park itself, but also on needs and options related to other aspects. These have to be considered and taken as basis for the negotiations about any further proceedings.

The following subsection should supplement the above mentioned expectations of resident people with priorities that were not formulated with respect to the TNP but whose realisation may interact with the TNP in a certain manner. The listing does include statements from different local people, such as herders and hunters, as well as employees of institutions or authorities. However, it is for sure not complete. A compilation of needs focusing on the ecological, economic and social dimensions of sustainable development in the Pamirs may be found in Breu and Hurni (2003), (Breu and Hurni, 2002) and in the Local Development Profiles elaborated within the Pamir Strategy Project in Kuna Kurgan (Murgab), Basid (Bartang) and Tavdem (Roshkala)⁵.

Change livestock management

An employee of a state farm explained that livestock management should be coordinated by a private company instead of the state. Then the number of livestock will increase. This is not running when livestock is distributed among the people

⁵See Domeisen, 2002; Imbach and Hergarten, 2002; Degen, 2002.

because most of them do not know how to breed it and may not make a good prize with it on the bazaar.

Increase the number of livestock

Many herders but also people who live in the villages all year round expressed their interests in an increased number of livestock. In fact private owned herd sizes are so small that most people cannot live on them⁶.

Assure supply of winter fodder

The amount and quality of summer pastures available is assessed as good and sufficient by most herders. However, the most limiting factor to increase livestock numbers is the amount of winter fodder. Thus people often expressed their interest in becoming support with available hay from abroad. Some herders located outside the TNP mentioned that meadows along rivers should be watered to increase their productivity or that special species of clover should be seed.

Improve financial credit system

Local people from Murgab area demand for long-term credits so that they get the chance to convert them before they have to pay them back. Today's credit system was often stated to support rich herders only.

Assess alternative sources of energy

Even though a continued use of *teresken* is recognised as precarious, local people mentioned to have no alternative. Most people await support from outside and expect that the state, international organisations and foreign donors will support them with electricity infrastructure and fuel.

As mentioned by ACTED, exact calculations of the amount of *teresken* are missing, thus it is not clear how long this resource may be still used. There is an urgent need to assess other sources of energy, like small scale hydro power stations in the western valleys and the provision of coal. The deposit of the coal mine in Murgab area is not analysed, however, its quality is mentioned to be good.

Develop industry

According to a man from Pasor the Bartang valley is rich in precious and semi-precious stones as well as minerals. With the support of foreign investors and the supply with energy industry should be fostered in this area on the long term.

Improve information network

Access to and exchange of information should be simplified by an improvement of the communication network between the permanent settled villages. People often explained that they get all their information from people who are travelling to their village.

Many local people who are not used to handle livestock or cultivate fields mentioned their interest in becoming support in form of advise and ecological teaching.

⁶According to Hangartner, the average number of livestock per household was between 6 and 48 sheep units in summer 2001 (2002, p. 76). The lowest number is given for the centre of Murgab and may be regarded as an exception. In average the sheep units per person is estimated with 10. According to information of a herder a family needs about 60 to 70 reproductive ewes or 15 to 20 yak cows or 30 sheep units per person to be able to live on livestock alone (Hangartner, 2002).

People from Khudara explained that it is difficult to calculate the amount of fertilizer needed for a field and herders mentioned that they do not know which herbs would be best for ill livestock or which plants may be used as medicine. One family living in Kokuybel region showed great interest in getting support concerning the use of medical herbs for own consumption.

Enhance educational equipment

A teacher from Khudara explained that pupils are taught in how to handle natural resources, but due to a lack of teaching material and school books, this remain on a rather basic level. However, a girl from Kokuybel region was the only member on this *jailoo* who could explain some herbs and their application. When asked about the source of her knowledge she mentioned to have learnt this in school.

Concluding remarks

The different objectives and **priorities of the TNP as assessed by the local resource users** point out that members of this actor category strongly focus on spheres and topics they are familiar with. Their statements all relate in some way to the natural resources they use. Most detailed interests are mentioned with respect to wildlife resources such as the Marco Polo sheep. Different statements point out that local people do not only associate these animals as a natural resource but as a cultural object. Thus their priorities mentioned with respect to Marco Polo sheep are much more differentiated than those focusing on other resources. They do not only include statements concerning the use or protection of Marco Polo sheep, but also their understanding of a sustainable use. The demand to participate in the planning process and the management of the TNP was only mentioned by few local people. Many local people indicate that they delegate the management of and responsibilities for the natural resources to the administration. This points out that people are not used in participation or in representing and communicating their interests as a group. Moreover, many people made the impression that they do not expect anything from the state anymore.

Many priorities of the local resource users are not mentioned with respect to the TNP. This points out that as long as the park does not focus on priorities assessed as important and urgent by local resource users it is of little interest for them.

The **actor categories on the regional and national levels** as well as employees of the Academy of Science named the improvement of their own financial situation as a main priority of the TNP. Therefore they would like to participate in the organisation of the TNP. However, since these actor categories would mainly like to bring in their own interests but delegate the responsibility for the park as a whole to others, the TNP authority faces a huge challenge to integrate the different interests with respect to the TNP. The problem of the distribution and use of financial resources and the missing transparency within the administration was only addressed by the manager of a hunting company but not by members of the park authority.

Particularly members of the **Academy of Science** but also employees of different authorities on the state level pointed out that the self-image and the claim of the Academy is still the one of being an important institution that provides the base information for any decisions related to the TNP. However, the regional branches of the Academy of Science also formulated a certain mistrust in the future cooperation between the TNP and the scientific institution. The traditionally important position of the Academy of Science constitutes a hindering factor for the establishment of the TNP authority as a higher institution that should be able to decide independently from other institutions.

Table 8.1: Overview of priorities of the TNP as seen by different actor categories. They focus on the three focal areas of the TNP (conservation, economic development, research). Priorities related to the TNP in general are added in a further row (based on interview data 2002).

Target areas	Residents	Administration	TNP auth.	Scientists	NGOs	Tour operat.	Tourists
Conservation	Improve the access to and supply with natural resources			Redefine borders and assess zones	Establish zoning	Improve access to the area	Simplify access to trophies and the area
	Improve the protection of woody resources	Enhance nature protection	Enforcement of laws		Combine wildlife protection with its use	Improve the management of wildlife	Guarantee trophy sized rams
	Rearrangement of wildlife protection		Motivate residents for nature protection				
Economic development and resource use	Create jobs outside the farming sector		Improve tourism	Create alternative sources of income	Foster tourism	Extend tourism	
		Improve financial situation		Enhance budget		Improve infrastructure	Improve infrastructure
Research and education			Improve ecological education	Improve research position	Educate staff		
Others	Bring in own interests	Enable participation	Improve the exchange of information	Improve the international cooperation	Enhance cooperation among all stakeholders		

The **TNP authority** is aware that the goals in nature conservation may only be realised with the participation of local people and investment in economic development. Thereby the focus is directed to the tourism business with a serious hope for international funding. Alternative economic activities are hardly discussed.

The demand of **international organisations** for an integration of nature conservation with resource use leads to the vision that the TNP should be managed as a biosphere reserve. These actors rather assess the future of the TNP as an instrument to support regional development in general than as an instrument to foster nature conservation and tourism. NGOs assess it as important to include all stakeholders into the decision making process of the TNP and to foster cooperation among all actor groups particularly with respect to the various state institutions.

The goals of **hunting companies** with respect to wildlife management point out that they combine the conservation of wildlife resources with their use. The conservation of resources inside the TNP should mainly focus on wildlife and thus guarantee a good source for trophies. However, hunting companies assess the ongoing of their business as most important priority which should not be restricted by the TNP.

The priorities of **tourists** are not really compatible with the objectives mentioned by the TNP authority and only focus on their own interests.

Different actor categories mentioned priorities focusing on tourism. However, the notions concerning this economy are very different, as will be specified in the following section. Investigations in education were only seldom mentioned. The park authority as well as the resident people thereby focus on a general ecological training of society to raise the awareness concerning the natural environment. Only employees of international organisation pointed to the importance to instruct park staff in terms of training and practical experiences.

8.3 Varieties between the notions of the target state of the TNP

Basically the visions of different actor categories concerning the TNP as outlined in the previous section correspond with each other and with the official goal of the TNP. All actor categories agree that the conservation of certain resources has to be intensified, tourism activities could bring new options for income generation and the area of the TNP builds a suitable experimental ground for all kind of research that have to be fostered. However, when regarded more closely it becomes obvious that varieties do not focus on the 'what' but on the 'how', meaning that the actor categories represent different notions concerning the way of realising the TNP. The following section thus gives an overview about the most evident varieties between the notions and should outline the underlying intensions of different actor categories towards the TNP.

8.3.1 Different scale

Local resource users are not really in the position to create visions about the future but have to cope with the harsh conditions of today's life. As a member of the TNP authority explained, only about one person out of 100 is thinking about the future (meaning on a scale of 20 years) today. Therefore the local resource users focus their priorities concerning the TNP in the really nearest future, while the park authority, scientists and also NGOs focus on long term objectives.

The same actor categories don't focus on the same spatial scale. Local resource users know the area they inhabit very well but sometimes have little knowledge of areas further away. Thus they focus their visions on the rather small area they know.

Statements of different actor categories pointed out that most members of the TNP authority and different institutions on the regional level as well as foreign scientists are badly informed on the remote areas within the TNP. These actors often focused their statements on the whole park area or even the Tajik Pamirs and only seldom specified certain habitats or regions inside the park.

8.3.2 Notions of borders

Due to their experience with existing protected areas, many local people explained that they expect the TNP to be a rather small area with permeable outer borders. Since local people guess that the protected zone of the TNP will be situated in a remote area that is not used by them they never mentioned that an assessment of the border line is important. Borders have to make sense for local people, meaning that they have to be associated with a natural feature in the spatial environment, such as a river or a mountain ridge⁷.

Other actor categories, especially the TNP authority and the scientists, address their interest very much to the clarification of the border line. The park authority seems to target on a preferably large area that should be included into the park. According to notions of members of this actor category, the exact definition of the borderline of the TNP is regarded as a very important step to the realisation of the park. Scientists are interested in the inclusion of special areas such as forest habitats and wish that not only glaciers and rocks are included into the park. Employees of international organisations agree with this notion but further ask for a strong participation of local people in the process of defining the park area.

8.3.3 Weighting of goals of the TNP

Even though the official goals of the TNP are directed to the improvement of regional development and touch all three spheres of sustainable development (ecology, economy and society), the TNP authority and national scientists still consider the TNP as a 'real' protected area which primarily focuses on nature conservation. Some members of the international scientific community also focus very much on the preservation of mountain biodiversity and thus on nature conservation. This may be explained with the fact that only natural scientists are acting as stakeholders but so far no social scientists or economists take part in the planning process. International NGOs assess the priorities in the sphere of economic development as most important but consider the ecological objectives as well. Members of the regional administration and local resource users primarily emphasis the economic improvements and not to nature conservation as main focus of the TNP.

As a consequence of the different rating of the goals, the ideas about the planned management category of the TNP differ between the TNP authority, foreign scientist and NGOs. The focal point of the TNP authority concerning nature conservation leads to their understanding of the TNP as 'national park'. However, foreign scientists associate with this management category other focal points. Even though they assess biodiversity conservation as a main goal of the TNP, they take into consideration the social and economic dimension and propose to realise the TNP as a 'managed resource protected area' (category VI in the IUCN classification scheme) or as 'biosphere reserve'. NGOs also prefer the management category of 'biosphere reserve'. Actor categories show little knowledge in international management categories but are aware that the existing Soviet categories need some revision and adaptation.

⁷Compare with the notes about the acceptance of the border of Murgab *rayon* along the river Alichur on page 94.

8.3.4 Access to resources and the regulation of resource use

The interests of the different actor categories vary most concerning the access to and the use of natural resources. Local resource users often stated that they need free access to pastures, meadows, fuel in form of wood and *teresken* and even wildlife.

The TNP authority would like to enhance wildlife management by limiting the access to and the use of natural resources within the TNP with the enforcement of the existing laws and a probable implementation of additional ones.

NGOs occupy a middle position between the park authority and the local resource users and ask for a better implementation of existing laws but also for the conversion of existing regulations that specify how much income derived from the use of natural resources (e.g. trophy hunting business) should flow back into the local budgets.

The employees of hunting companies welcome a better control of poaching done by local people as long as they are not constricted in their own business. Hunting companies as well as hunting tourists clearly focus their interests on a good access to wildlife, particularly to trophy sized rams. This interest assumes that the Marco Polo sheep populations are provided with good conditions by regulating the use of pastures and the amount of illegal hunting so that the ungulates can develop well. In this sense the notions of this actor category concerning conservation correspond with the ones of the TNP, scientists and NGOs.

NGOs, scientists as well as the park authority and local resource users ask for the creation of different zones within the park boundaries to regulate the use of resources. However, local resource users connect with these zones only a regulation of hunting, while the other actor categories understand zoning as an instrument for the regulation of all uses such as tourism and pasture use.

8.3.5 Cooperation and competition

Objectives focusing on cooperation are mentioned by few local resource users with respect to their participation in the planning process of the TNP. They would like to represent their own interests within the TNP but on the other side no member of this actor category expects and asks for information about the TNP from state institutions.

The statements of the different actor categories from all administrative levels point out that a competition for funding and power could become realised at the expense on an increased cooperation. All these actor categories mentioned to need more support in terms of finances and equipment and showed interest to be involved into the planning and implementation process of the TNP for they hope this project with international attention will bring in urgently needed budget support. However, only few members of the TNP authority and the Academy of Science emphasized the importance of an increased cooperation with other institutions, while the other actor categories did not mention this as a priority.

8.3.6 Orientation towards tourism

Local resource users expect the creation of new jobs with an increase in tourism. Many local people understood these jobs as part time activities that could be conducted during some weeks in summer from a part of the family while the others would still be occupied with the breeding of livestock or agricultural activities. This points out that tourism is only assessed as an option to diversify their household strategies but not as a substitution for any actually conducted activities.

On the other side, international organisation fear that local people from different levels are not able to profit much from tourism since their experience to deal with foreign guests is small. Furthermore, the tradition of local people to welcome every

traveller as guest to their home and to serve him for free as long as he stays there is hard to be brought together with tourism. Similar to the business with natural resources (e.g. international hunting, mining and hydro power plants) the local population may not be able to promote tourism on their own. Therefore this business is expected to be controlled by people coming from abroad, meaning from outside the Pamirs or even from outside Tajikistan, as demonstrated with the already existing hunting business⁸.

Employees of hunting companies mainly focus their notions concerning tourism on trophy hunting and thus on wildlife, while the TNP authority and NGOs ask for a promotion of so called eco-tourism. This form of tourism should take into account the interests of local communities and prevent the environment from negative impacts.

8.3.7 Embedding of the TNP in regional development

The official goal of the TNP focuses on whole application areas than on specific aims. As a result, members of the authorities on different levels often mentioned that the TNP will contribute to many of their actual needs and thus have great positive effects on the whole region. Some people seem to treat this project as a sort of miracle cure that – once established – will be able to solve the majority of local problems.

In contrast to this vision of the authorities, local resource users seem to expect little from the TNP. Important interests of them were not mentioned in relation with the TNP but focus on a broader regional context. Their main interests ask for an unhampered access to pastures and the availability of electricity or other energy resources which are both not included as specific aims of the TNP.

⁸Hunting companies in Murgab area are often managed by Tajiks living outside the Pamirs or by Russians.

Chapter 9

The actual state of the Tajik National Park

The analysis of the actual state of the TNP focuses on the organisation and handling of natural resources as part of the land use system, including the consumptive use of resources and their conservation.

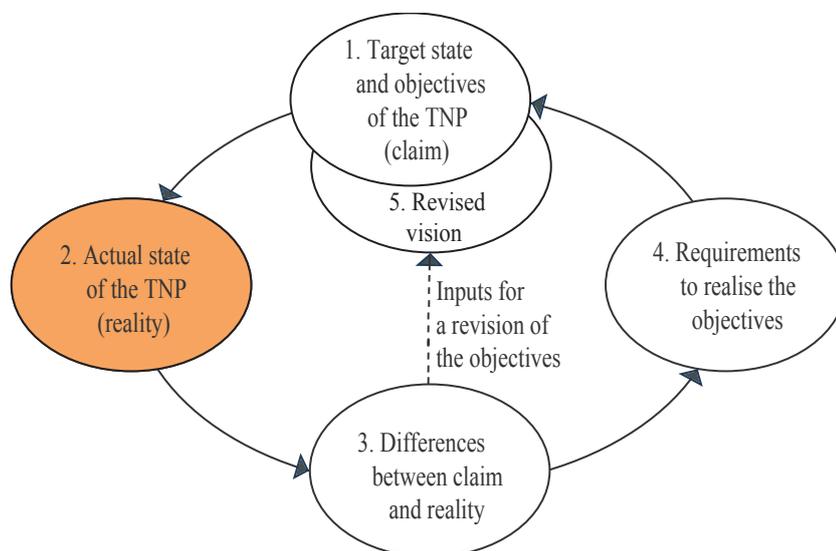


Figure 9.1: Step 2 - Assessment of the actual state of the TNP (own illustration).

The first section focuses on the (consumptive) use of natural resources and mainly refers to the local level. Different activities on various levels related to the conservation of resources are outlined in section 9.2. This includes the organisation of the TNP and the management of resources by state institutions. In addition, the handling of and the awareness opposite resource conservation by not state-run actor categories are analysed. Section 9.3 gives a description of the perceptions of different actor categories toward the TNP. The interactions between actors and landscape ecosystems are completed by an analysis of the discrepancies between the actual interests of actor categories related to the use of resources within the TNP in section 9.4.

9.1 Types of consumptive use of natural resources inside the TNP

The use of natural resources inside the TNP is manifold and includes all actor categories described above in one or another way. It is not differentiated between

protected and non protected areas, but dependent on cultures and natural environments and thus assigned to functional landscape ecosystems which belong together.

Even though the use of resources is an economic activity and it's output is directly marketable in terms of income generation, this subsection does not focus on the economic value of these resources but on their treatment by different actor categories.

The following remarks mainly base on the statements of the actor category local resource users. Additional information from scientists, NGOs and local authorities are considered.

9.1.1 Use of vegetation

Grassland



Figure 9.2: Herding of sheep and goats in Muzkol area. The white areas are salt spots covered with very little vegetation (Photo: A. Haslinger, September 2001).

Grassland is mainly used as pasture and hay field as illustrated in figures 9.3, 9.4 and 9.5. The altitudinal distribution of pastures differs between the three study areas (cf. 9.1). As a general rule, pastures are located higher up in the Eastern Pamirs than in the western part of the park.

Many herders characterised pastures to be everywhere where it is green. However, pastures are difficult to encompass in the field since livestock is not only grazed on green meadows along the river. Yaks may frequently be observed on northern slopes which provide dense vegetation due to better water supply. Southern slopes are characterised by a dry microclimate¹ and provide little herb species which are not visible from distance, thus these slopes look barren. However, they

are often grazed by sheep and goats. Water supply is not only important for vegetation cover, but also needed as drinking water by livestock and people. Therefore the location of *jailoos*, *kuzdeus* and *kishtoos* are limited to places with permanent water supply during the season they are used.

Table 9.1: Altitudinal distribution of summer, spring/autumn, and winter pastures within the three study areas. Numbers are given in m a.s.l. (based on mapping inside the study area, 2002).

	Kokuybel	Yashilkul	Muzkol
Summer pastures	4,000 - 4,600	3,800 - 4,600	3,600 - 4,300
Spring/Autumn pastures	4,000 - 4,400	3,800 - 4,100	3,300 - 3,700
Winter pastures	3,900 - 4,000	3,700 - 3,900	3,700 - 3,800 (Aktash) 3,000 (Bartang)

Mainly summer pastures are defined as the whole grazing area that is used by

¹Especially in Kokuybel area the valleys are aligned from the West to the East. The ridges on the northern slopes are covered with small ice fields which feed the little creeks all year round and thus vegetation is relatively dense. Sun radiation is much more intensive on southern slopes, thus they are seldom covered by ice, causing creeks to run dry in fall. These small scale differences lead to a clear difference of the vegetation cover on northern and southern slopes.

one herder. Such a pasture does not comprise one connected area but its parts are often widespread inside a valley or spread over a main and certain side valleys. Small valleys are counted as one pasture, meaning that there is one herder². Side valleys that are not easily accessible are not used by livestock or only grazed by yaks³. Huge valleys are used by several herders and may contain several *jailoos*⁴.

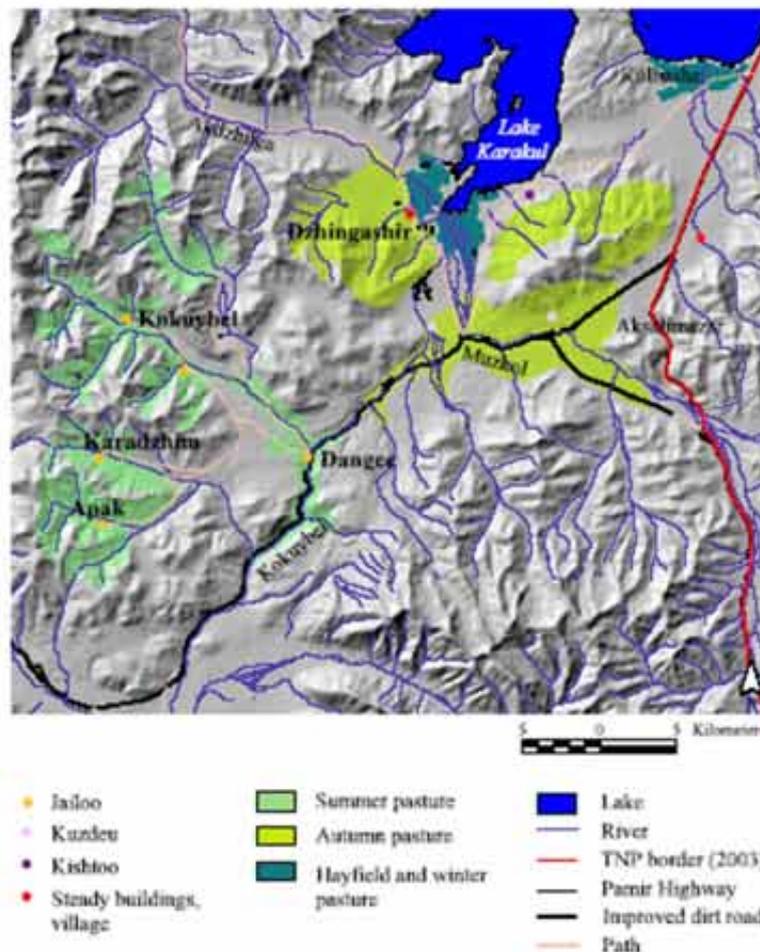


Figure 9.3: Pasture use in Kokuybel area during the annual cycle (Data source: DTM derived from Russian topographic map series 1:200,000 by CDE; TNP according to TNP, 2003; land use based on interview data and mapping, 2002).

Herders often use the same pastures every year and only those with few livestock are reported to change pastures almost every season. Albeit the access to pastures is free for all people, some people who live on a *jailoo* in the eastern part of the TNP mentioned that other herders are not welcomed since all vegetation is already used by their own livestock. Furthermore, they explained that the pastures around their *jailoo* are used by members of their family since ancient time and thus they assert their private claims to these pastures. In most cases the distribution of pastures among the residents seems to be dependent on kin relations. Only in the southern part of the TNP summer pastures are assigned by the *gozkhor* and may not be chosen freely. However, a herder from the same area explained that they may chose the pastures inside a certain area. He reported that his family changed the pastures

²The fact that one herder is on a pasture does not mean that only his private livestock is grazed there, since a herder also looks after the livestock of his family and friends.

³Unlike sheep and goats, yaks are not herded and may graze freely. The males don't return to the *jailoo* every night and thus may reach remote grazing grounds.

⁴For further information on livestock management in the Eastern Pamirs see (Domeisen, 2002).

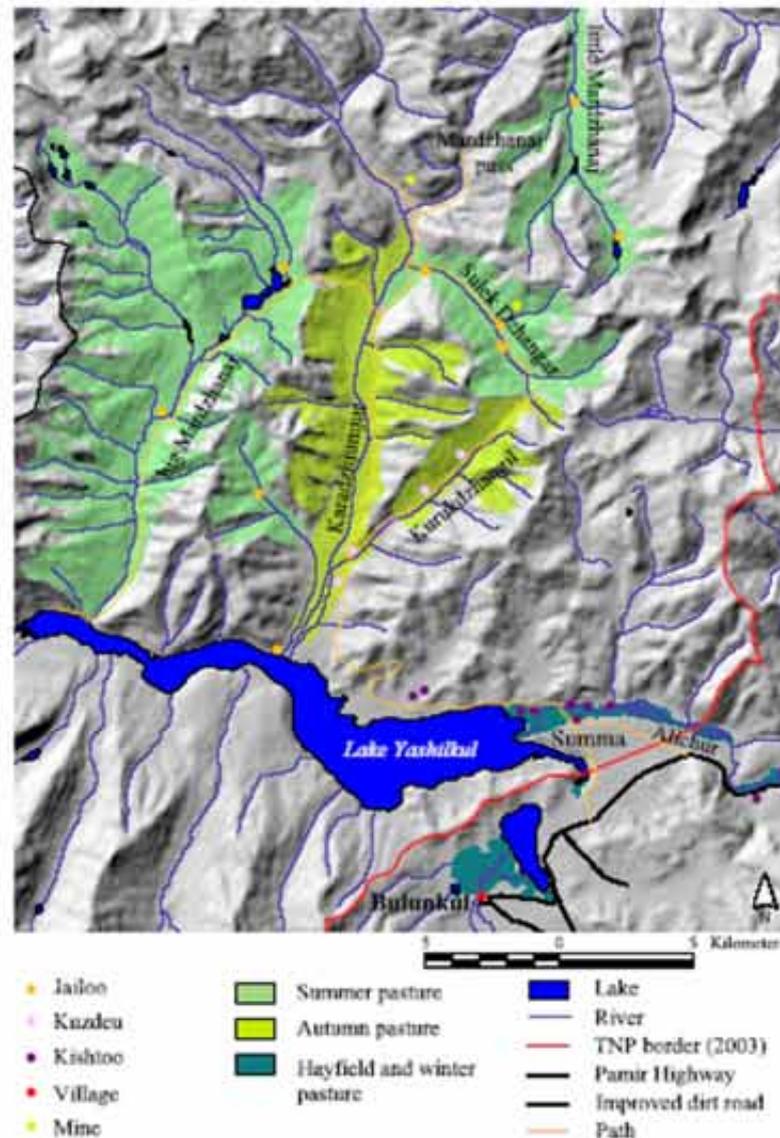


Figure 9.4: Pasture use in Yashilkul area during the annual cycle. A special use of resources within this area is mining. Today the mines are not in use anymore (Data source: DTM derived from Russian topographic map series 1:200,000 by CDE; TNP according to TNP, 2003; land use based on interview data and mapping, 2002).

two years ago, because the warm climate on a lower located pasture caused too many livestock diseases. Thus they decided to change from the lower pasture to the most remote and probably highest located pasture in the area. Since then they never had the same troubles with livestock diseases again.

In most areas the departure to the *jailoo* is set by the weather conditions and thus varies from year to year. Mostly people leave for the *jailoo* in May or June and come back in September or October. They often make a stopover for some days or weeks on a pasture located in between the *kishtoo* and the *jailoo*, called *kuzdeu*. In some areas the departure to the summer pastures is regulated by the farmer associations. They set a time span within no animals are allowed to graze on the winter pastures that are often also used as hay fields. These dates fix the time when herders have to stay on the high pastures. All movements with livestock are made on foot, only some families have the means to transport their housing by car or truck.

In the Muzkol area herders from Bartang often change pastures during the sum-

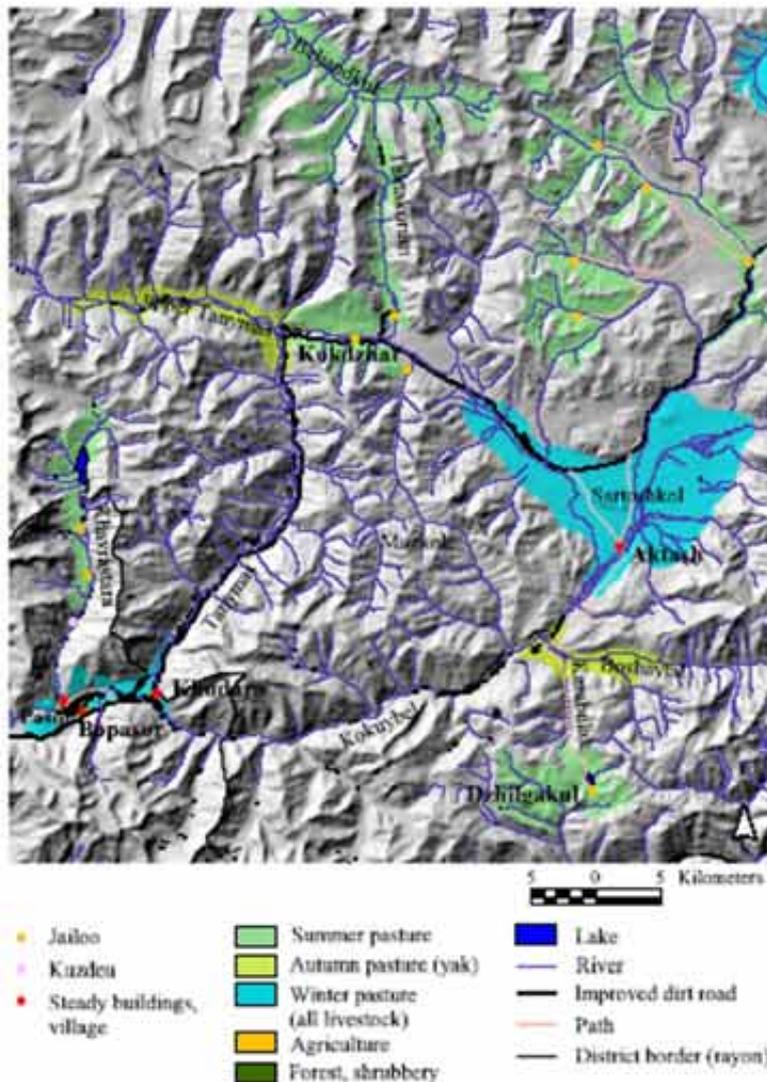


Figure 9.5: Pasture use and agriculture in Muzkol area during the annual cycle (Data source: DTM derived from Russian topographic map series 1:200,000 by CDE; TNP according to TNP, 2003; land use based on interview data and mapping, 2002 and 2001).

mer and also from year to year since the first family who comes up to the pastures can chose the site for their *jailoo*, the others who come later have to take what is still free. The departure of families from the western valleys to the high pastures is dependent on the work on their fields around the village. Some villages give all their livestock to one or two herders who have been chosen by the village community to do this job for one season, so that the majority of the inhabitants can stay down and work on the field in summer.

Today almost the same pastures are in use as under Soviet ruling and only few remote pastures are not used anymore. What changed to a much wider extend is the mobility of herders. This has several causes: even though remote pastures may provide good fodder, they are only little used since most people cannot afford the transportation of animals and equipment to these places on their own. Their mobility is limited and thus they cannot provide themselves with provisions on such pastures. Furthermore, many people going on high pastures explained that they don't like to be apart from their relatives and any social event for several month. On the other hand, exactly the remote pastures are the ones that are not overused

and may provide good fodder for livestock. This fact leads to a doubled disadvantage of poor households, since they are forced to use the pastures around the villages that are under stress due to high stocking rates. These overused pastures don't provide options to produce healthy and fat animals which build the base to increase livestock numbers. In general, the farther away pastures are located from a centre, the less they are used, since only rich herders have the means for transport (see Hangartner, 2002). This is also true for the area inside the TNP, as table 9.2 points out. The pasture area of Muzkol is very remote and only used by few herders from Bartang side. Muzkol area is one and a half time as large as Kokuybel area but contains about the same amount of livestock. Kokuybel area takes in a medial position. The area provides good pastures (55.5% of the total area is grassland) but is not very intensely used due to the distance to Karakul village. Herders from Apak affirmed this medial stocking rate and explained that in this area all pastures are used and no free pastures are left. The pastures around lake Yashilkul are intensely used by Kyrgyz and Tajik herders. Except the pasture in the little Mardzhanaj they are easily accessible from Bulunkul and Alichur. Yashilkul is the smallest of the study areas and only contains 37.5% grassland, but contains the same amount of livestock as the other areas, thus contains a high stocking rate. However, it is to mention that these stocking rates are calculated on all pasture area and thus the same stocking rate results for the summer and the winter pastures. In reality this is not true. Stocking rates of summer pastures are much lower than those of winter pastures since the livestock of different summer pastures units on the limited winter pastures to use them all together. This points out that winter pastures have to be handled as the key element when assessing the appropriate stocking rates.

Table 9.2: Stocking rates of livestock inside the study areas. The surface numbers refer to the pasture areas within the study sites like outlined in figure 5.3. One yak is counted as 5 sheep units (su), one cow as 3 sheep units and one ox as 4 sheep units (based on interview data and mapping inside the study area, 2002).

	Kokuybel	Yashilkul	Muzkol
Sheep and goats	1,550	1,900	1,500
Yak	617	620	600
Cows	33	0	109
Oxen	0	0	60
Total sheep units (su)	4,734	5,000	5,067
Grassland (ha)	20,446	8,747	25,460
Total area (ha)	36,845	23,317	55,690
Stocking rates on grassland (su/ha)	0.23	0.57	0.2
Stocking rates on total area (su/ha)	0.13	0.21	0.09

Migration did not only change in terms of distance but also in terms of temporal movement. Herders from Kokdhzar reported that during the Soviet era they did not stay longer than one month on a pasture and then moved to another one, while today people stay for almost all summer on the same pasture.

High pastures are often used unsystematically. Changes between areas of a pasture are done regarding the amount and offer of vegetation. Only few herders knew the vegetation and hardly any herder could show special areas that provide medical or nutritious herbs for livestock. One of the few well known plants is *teresken*. Its small leaves are reported to be very nutritious and constitute an important fodder

for livestock, especially for sheep and goats during winter when grass is covered with snow and ice. However, the same plant also constitutes one of the few sources of fuel in this area.

Grass is never moved around *jailoos*, due to difficult transport conditions it cannot be brought down to the *kishtoo*. Mowing is done for about one month from mid August to mid September on hay fields along rivers and lakes that are also used as winter pastures. To avoid overstocking of winter pastures, their use is strictly coordinated by the farmer association or the *gozkhos*. However, since these areas providing dense meadow vegetation are very limited and used as both hay field and winter pasture, they are often exposed to degradation. Degradation takes place in different manners. Intense grazing leads to a selective reduction of certain plant species and fosters the replacement of herbs with grass of lower quality. Selection and dense stocking rates cause a decline in the vegetation cover. Furthermore, trampling leads to soil compaction which causes an increase in erosion. These negative processes can be found on winter pastures in Yashilkul and Bartang area. The winter pastures in Kolbashe are not directly damaged by high stocking rates but show a high salination.



Figure 9.6: Yaks grazing on the summer pasture. Unlike sheep they are not herded (Photo: A. Haslinger, August 2001).

The men who leave the *jailoo* and go down to the hay fields share one yurt together. Only one woman comes down with the men to cook for them, at the same time the children who have to attend school come down from the summer pastures, while the rest of the families stay up for another month. In former time mowing was done by employees of the state farms and school children. Some men stated that during the time span in which mowing is allowed they are not managing to mow all grass since their labour forces are limited.

Due to geomorphologic processes some of the river close meadows are covered with humps and may not be mowed. They are only used as pastures. Pastures around villages are often also grazed in summer by livestock of poor families that cannot afford to go to a high pasture. As a result, village close pastures are intensely used all year round and since they have no resting period, degradation is taking place.

Degradation of pastures is not only caused by overstocking with livestock and intense grazing but also by widespread gathering of *teresken*. The plant communities in this altitude are highly adapted to the harsh conditions and once the vegetation cover is damaged, degradation takes place without hindrance. A low quality and quantity of vegetation, compressed ground, salt crusts and increased erosion are some of the most visual degradations on such pastures (see Ladygina, 1960). Degradation on village close pastures also affects the TNP because a recovering of the sites is very difficult and irrevocable degradation shorten the already sparse natural resources of the region. Thus people have to move to non-degraded pastures that are located farther away from the centres but closer around or even inside the TNP.

An important limiting factor for the quality of the pastures are the climatic conditions. Herders often stated that grass is decreasing with every year due to changed weather conditions and as a consequence the quality of the pastures became worse. Degradation is most visible on productive wetlands, while on arid sites that are not very productive degradation is not obviously seen. The quality of arid sites

is more dependent on environmental impacts such as rainfall than on grazing⁵. A herder explained that in former time the grass was growing in May, but today even in June no grass is appearing because it is still too cold. Another cause of a loss in vegetation is attributed to the dryness. However, statements concerning weather changes varied much among herders and other local people⁶. Agreement exists concerning the importance of the snow, since the amount of snow in winter and the amount of rain in spring are the critical factors for pasture quality because they decide how much water will be available during the vegetation period. The amount of snow is very important mainly for wetland vegetation on hay fields around lake Yashilkul and lake Karakul. This vegetation is strongly dependent on ground water which is not fed by precipitation but by snowmelt. The quality of vegetation on hay fields is further dependent on water level fluctuations. An increased water level cause the decay of grass roots, a low water level cause desiccation. Due to the harsh climate and the short vegetation period a recovering of these plants may need several years, as a local botanist explained.



Figure 9.7: Hayfield and winter pasture in Kol-bashe. Mowing is done from mid August to mid September (Photo: A. Haslinger, August 2002).

Grassland is not only used as pasture and hay field. Different plant species are used as medicine, forage, fruits and decoration. About 40 fruit bearing species are growing in Vanch valley, cultivated (e.g. Darvaz plum, apple, apricot, peach) as well as natural (e.g. walnut, hawthorn, currants) (Badenkov and Buzurukov, 1993). In the Eastern Pamirs residents mentioned to use herbs such as *Leonopodium ochrolencum*, *Thalictrum* species and *Potentilla* species as tea with medical effects. Roots of golden root are very treasured because they are used as medicine against numerous afflictions. Roots of *Amebia tibetana* and *Macrotomia euchromia* are used to produce paint. Many people mentioned that they are not sure about the different plant species or that they forgot how to prepare

them. These statements imply that the knowledge of plant species, preparation and application is little and thus the degree of medical plant use is limited to few people (data from fieldwork 2001).

Wood, woody sub-shrubs and manure

Woody sub-shrubs such as *Ceratoides papposa*, called *teresken*, and *Artemisia* species, called *shivaq*, are intensely used as fuel in almost all households. Even rich households who could afford to cook with gasoline often use *teresken*. As a result, woody sub-shrubs are declining. As an employee of the local authority explained, wherever there is a settlement there is intensive use of *teresken*, no matter if this area is outside or inside the TNP or any other protected area. According to the information of different local people on summer pastures and in the villages, the effort to harvest a certain amount of *teresken* is exceeding the sustainable amount. This may be interpreted as an indices that the amount of take off is exceeding the re-growth.

⁵Research on carrying capacity on pasture areas in western Mongolia from the University of Greifswald led to the hypothesis that arid environments are not overused since the amount of animals that would be necessary for this do not find subsistence on these sites (oral information from A. Zemmrich, Bielefeld, 24.1.2003).

⁶Some people stated that it became much dryer, others argued that especially in summer there is more intensive rain. Statements concerning the temperatures in winter and the amount of snow varied not from region to region, but from pasture to pasture.

However, there are no actual studies available that calculate the exact amount of *teresken* that is used per day, its growth rate and its relation to the growth of the human population.

Woody sub-shrubs were already intensely used during the past, particularly around the yurts, as the notes of Rickmers-Rickmers from the German - Russian Pamir - Alai expedition in 1928 may point out:

”Von Gordoba am Karakul vorbei bis zum Tanimas zählte ich nur ein Dutzend Kirgisenjurten Das bedeutet Mangel an Futter, Lebensmitteln und Brennstoffen, denn die Menge der Bewohner hängt von der Ausdehnung der Grasflächen ab. Ein geringer Viehstand liefert aber auch wenig Mist fürs Küchenfeuer. Das holzige, an Wermut oder Lavendel erinnernde Kraut Teresken (*Eurotia ceratoides*), der einzige andere Brennstoff auf dem Pamir, kommt längs der Hauptwege und um die Lagerplätze herum nur noch in bescheidenen Mengen vor” (Rickmers-Rickmers, 1930, p. 30).

This statement highlights the close connection between pastures, woody sub-shrubs and manure: a small amount of usable pastures or a bad quality of pastures lead to a reduction in livestock numbers, thus reducing the amount of manure that may be used as fuel. This on his part leads to more intense use of woody sub-shrubs as fuel and thus reduces the amount of fodder available for livestock especially in winter. As during the time prior to the Soviet era this connection is again becoming important for the use and conservation of natural resources nowadays.

Some people from the Eastern Pamirs collect *teresken* on areas around the villages to sell them on the bazaar and not only for own consumption. People on high pastures sometimes use *teresken* and *shivaq* in summer to save the *tizak*⁷ for the winter month in the villages. In winter fuel is intensely used but hardly available, thus it is expensive⁸. In the Eastern Pamirs, sometimes also cushion plants such as *Acantholimon diapensioides* are used as fuel, while in the Western Pamirs people often use wood as fuel. Inhabitants of Khudara told that they do not use dung for the fire because they use it as fertilizer on the fields.

In the western valleys, wood is not only cut for fuel, but also for the building of the traditional Pamiri houses. This was not always like this, as a local man explained. During the Soviet era, fuel was provided in form of coal for every household, and timber was brought from Osh (Kyrgyzstan) or even from Siberia. Today, the trees of alluvial forests in the deep valleys are excessively cut, as a walk to the last major forest of Khudara showed. Many trees were cut fresh and used for the building of a new mill, others were taken illegally by local people. A man from Khudara explained that local people often crack the branches of trees to let them die off and then collect them without the need of a permission. The forest is reported to decline everywhere



Figure 9.8: Fuel used on summer pastures. This family uses *teresken*, *tamarix* and dung for cooking and heating (Photo: A. Haslinger, August 2001).

⁷ *Tizak* is prepared in two ways: The yak manure from the place where the animals overnight is dried in the sun and then piled up every afternoon. Manure from sheep and goats is pound inside the enclosure and taken out as bricks weekly.

⁸ A bundle of *teresken* weigh about 12 kg and costs two Somoni (about 0.7 US\$ in summer 2002). According to ACTED, an average household needs one bundle per day in summer, two in winter.

in the Pamirs, especially willow is preferred because of the better burning value. Thus, sometimes only poplars remain on a once abundantly covered location. This cutting results in deflation of alluvial sands. As Badenkov (1990) wrote, microclimatic changes following the removal of the forest severely reduce the likelihood of natural regeneration under arid or semi-arid conditions. Since the cleared areas are used for grazing livestock, the process is virtually irreversible. Other consequences of this deforestation are the promotion of *xerophytic* plant species and a loss of fine-earth from mountain soils (Sukachev, 1960).

Mulberry trees (*Morus* species) are widespread in the lower part of the western valleys. The fruits are dried and especially during the civil war composed an important food resource for the Pamiri people. However, according to Badenkov and Buzurukov (1993), these trees are more and more coming under pressure with the expansion of the silk production (silkworms are eating a lot of mulberry leaves). This may be true for the north-western part of the TNP but could not be analysed within the field campaign.

Agriculture



Figure 9.9: Women reaping crop in Pasor. Men collect the sheaves and bring them to the threshing area. Threshing is done with the help of donkeys and oxen (Photo: H. Kreutzmann, September 2002).

Agriculture can only be conducted in the western valleys of the Pamirs. The absence of agriculture on the high elevated eastern plateaus has several causes. First, due to their cultural background as nomads and mobile pastoralists Kyrgyz people are not really used to cultivate land on a large scale. Secondly, the climatic conditions in altitudes of more than 3,600 m a.s.l. do only permit the survival of few crops. However, investigations of ACTED in Madyan valley and Murgab centre showed that with a certain effort, small scale agriculture of special crops is possible even in the Eastern Pamirs. Most Pamiri people and few Kyrgyz people of Murgab rayon keep smallest vegetable gardens with potatoes, radish, and carrots in front of their house or inside the court yard. These vegetables are not as much harmed by the

cold but strongly dependent on regular watering. Only the few vegetable gardens inside the nine valleys located inside the TNP are inside the protected area.

Agricultural land in the western part of the park is mostly located on the fans of the alluvial cones of the rivers. Most villages are located on the same spots, thus area for agriculture is strongly limited (cf. figure 7.5). Most villages of the western valleys are excluded from the TNP and therefore the crop land within the park is small and restricted to the upper Bartang valley. Within the Muzkol study area agricultural land only accounts for 671 ha or 1.2%.

After independence and the leasing of crop land to the residents, people restarted to cultivate cereals, potatoes and carrots. According to a statement from a local man, the crop was almost doubled since independence⁹. The increase in crop is not assigned to the use of fertiliser, as a local man explained. However, due to a decrease in organic fertiliser (caused by the decline of livestock) the use of synthetic fertilisers and chemicals was intensified. According to Umarov (1998), pesticide residues have

⁹Herbers (2001) estimates the level of self-sufficiency in the Western Pamirs to be between 60 to 80% today, which is comparable with the one in other mountain regions, e.g. Switzerland.

already been detected in soil and plants near the high-altitude lake Zorkul in the Eastern Pamirs.

However, today local people are more motivated to obtain a good output than during the Soviet period, since they are now producing for their own family. Furthermore, almost all members of a household can be engaged as labor in the working process. During the Soviet era people used more fertilizer from abroad, today they use dung and artificial fertiliser that is available from MSDSP.

Crop-rotation is done in an annual cycle, but as a local man explained, this is up to the families. After the breakdown of the Soviet Union people from Khudara tried to cultivate Turkish wheat, but it was not successful. Thus they now cultivate the same species as in former time. Oats are cultivated together with beans since this is increasing the productivity. The quality of soil is estimated to be good in Khudara, but this is dependent on the watering. People from Khudara do not use water from Kokuybel for their fields since this is told to be salty. People from Pasor mentioned that there is a lot of salty soil especially in Bopasor and it's impossible to grow crops there. Therefore people from this village are cultivating land 30 km lower down in the Bartang valley.

People from Khudara mentioned that they have no troubles with soil degradation or plant pests, but sometimes grasshoppers and beetle harm their crops. Due to the fact that the cultivated land is located on the flat area along the river terrace and not on the slopes, soil loss caused by watering steep slopes or by erosion along adverse routed water channels may be assessed as small.

In vegetable gardens around the houses people from Khudara and Pasor are growing onions, tomatoes, cabbage, cucumbers, pumpkins, carrots and even melons. There are no fruit trees in these villages, however, a man stated that he would like to plant fruit trees a little bit further down. He explained when melons are growing there, apricots and other fruit trees will grow there too.

9.1.2 Use of wildlife

Different species of wildlife are trapped and hunted for food and medical reasons. Wildlife is used as a resource by all residents and not only by those who live on the *jailoo* in summer. Products of wildlife are sometimes sold on the bazaar or traded with relatives. This could be observed several times.

The most hunted animals are Marco Polo sheep and Asiatic ibex. Herders and other local people use them as source of meat. People often stated that they do not slaughter livestock when they need meat but go hunting. A herder explained that they use everything that looks like meat and therefore make special hunting trips early in the morning. Other herders put traps in the entrance of marmot dens and control them in the evening. Most herders however do not have time to go hunting while they have to look after livestock. Only if they have a gun and ammunition they take it with them on the pastures to shoot what is accessible from there. Hunting of ungulates is mostly done in summer, but some residents also hunt in winter, when the amount of snow allows it. Most people seem to make no difference between the sex they shoot. When available, rams are preferred because they provide more meat. Some residents explained that they only shot young rams since the trophy sized rams are reserved for the tourists.



Figure 9.10: Trophy sized horns of a Marco Polo ram already under decomposition (Photo: A. Haslinger, August 2001).

In fact most horns found on *jailoos* and villages are from older, often trophy sized rams (generally from age five). Since hunting on Marco Polo sheep is an illegal activity for residents, numbers mentioned varied and were greatly understated. One herder stated not to shoot Marco Polo sheep because they should be hunted by foreign hunters who bring in money. Therefore he only hunts for ibex. Other people mentioned that it is illegal to hunt ungulates and thus they don't do so. However, they would go hunting if it would be allowed.

Hunting of ungulates is reported to be intensely done by military staff and people from the different levels of administration. Local people mentioned that these people hunt large quantities with modern automatic guns that allow them to kill several animals at once. The military staff is not dependent on the price of gasoline or the organisation of firearms. They mostly hunt inside 'the system' where hardly no other persons have entry admission and where ungulates are not disturbed by livestock and thus are reported to be numerous¹⁰. Herders as well as employees of NGOs stated that members of the authority mostly do not hunt themselves, but lend their rifle and ammunitions to others, ordering the meat of Marco Polo sheep as rental fee. The degree of disturbances is not the same in all regions, as different activity pattern and habitat behaviour of Marco Polo sheep indicate¹¹. It seems to be strong especially along the roads and in easy accessible areas close to the villages and *jailoos*. Low disturbances are not absolutely granted in remote areas or in areas assigned to a protected zone, but in fact dependent on an active control of poaching and a strict management of livestock numbers on high pastures by an institution, be it private or state-run.



Figure 9.11: A herder and his dog looking for Marco Polo sheep and ibex in Muzkol area (Photo: A. Haslinger, September 2001).

Besides ungulates, also other animals are hunted as source of meat and income. On almost all *jailoos* people trap marmots. Their fat and grease is used for medical purposes, while the meat is only seldom eaten. An older man from a *jailoo* showed his collection of marmot furs and explained to trap these animals regularly to sell the furs to a trader in Osh. Hares are caught with traps and shooting stones, mostly during winter. *Ulars* and other partridge species are caught with traps. Their meat is said to be good for digestion. Some families catch young animals and keep it in their yurt to feed it up. People living along rivers and around lake Yashilkul are often fishing. They put a net into the water where fishes ensnarl and can be collected once or twice a day. Only few men fish with a net from a small boat on the lake. Fishes are not dried and stored for the winter and only consumed fresh. Hay makers in Kolbashe (south of lake Karakul) reported that local people do not fish in the lake since there are only few fishes (Karakul stone loach *Noemacheilus lacusnigri*). Russian people however are reported to fish even in winter through the ice of lake Karakul.

Few people reported that they caught Marco Polo sheep, wolves or snow leopards alive for zoos or other purposes. This is only a rare activity. Sometimes raptors are caught and trained for hunting of small rodents. A local herder exemplified to has killed a snow leopard some years ago. According to his comments the killing was a haphazard action and since he could not manage to sell the fur until today, he never intended to live on this business.

¹⁰Since 'the system' is a prohibited zone, there are no census data of this area available.

¹¹For further information concerning the human influence on ungulates in the Eastern Pamirs see Lüthi (2003).

Several animals are used for medical purposes. The fat of bears and marmots is said to be very medicinal. The meat of camels is mentioned to be very healthy, while the meat of horses may cause allergies. For really serious diseases a herder reported to eat the meat of dogs. The excrement of small animals are often collected on high pastures to produce a thick sticky lump that is used against headache, stomach ache, tooth ache and fractures. This medicine called *mumijo* is often sold on bazaars in all Central Asia¹².

Some people kill animals they assess to be dangerous. Wolves are often shot by herders on the high pastures since they make up a big threat for sheep and goats. In winter they may even attack yaks. Foxes and marten are killed just to limit their numbers, as a herder explained when he showed a whole family of marten he killed in the morning.

Wildlife is also used by foreign people, namely trophy hunters. About 80 trophy hunters visit the Eastern Pamirs per hunting season to shoot a Marco Polo sheep or an Asiatic ibex. Employees of the hunting company Badakhshan, located inside the TNP, reported that they serve about 6 clients per season. This means that only this number of trophy sized rams is allowed to be shot in the hunting area. Clients are picked up in Khorog or Murgab and brought to the hunting camp short after their arrival, seldom they reach the remote camps by helicopter. About half a dozen of hunting guides are facilitating the hunting trips and due to their excellent knowledge of the area and the animals, such a trip never takes longer than three to seven days.

9.1.3 Use of water

Hot springs are widespread in the Pamirs. The bigger ones are often used as spas, like the one in Summa. It is open for everybody and intensely visited by people from Bulunkul. The hot water is channelled to a basin that is enclosed by a wooden hut. The water from the basin runs directly back to a nearby river, therefore the use of soap is forbidden in spas. The pool is very small and left a rather unsanitary mark. Larger and well attended hot springs located outside the TNP, like the famous spa of Garmchasma, are in a much better condition due to the fact that these spas are visited also by foreign people and for medicinal purposes are thus maintained by special staff. Sometimes the water coming out of the spa is so hot that it has to be mixed with cold water from a river. Spas are often frequented by all kind of people and all year round.

At some places the water of hot springs have been analysed. Different minerals and trace elements could be found and people often bottle such water to drink it.

Not all hot springs in the area are used as spas. Sometimes the water is not channelled and only used to make the dishes or wash clothes. Only one case was seen where hot water is used to heat the rooms of a house, which was very effective.

Due to the high relief energy and the river network of Tajikistan, the hydropower potential of the country is huge. It is used since the 1930s with the construction of several hydro power plants. Today the impact of these hydro power stations on the environment within the TNP, especially on the water quantity in the rivers, is still little. However, on several locations inside and along the borderline of the TNP hydropower stations or storage basins are under construction (e.g. lake Yashilkul), even though abundant natural hazards and high investment costs limit the economic potential (Breu and Hurni, 2003a).

¹²*Mumijo* derives from Grecian and stands for 'protecting the body from illness'. It is not made of excrements of small animals but even though there are many studies focusing on this famous medicine its ingredients still remain a mystery. Mumjio is found in caverns and crevices in high altitude with an intense sun radiation and a special soil composition, fauna and flora and microbes. It was already used more than 2000 years ago in the medicine of Central Asia Heldmann (2003).

9.1.4 Use of mineral deposits

The mines of the Alichur district are located inside the TNP and contain deposits of boron, silver, tin, copper and other minerals (Breu and Hurni, 2002). Today they are not in use anymore. A herder reported that the mine in Sulek-Dzhangar was only used for two years by Russian miners. Then they left, leaving ugly scars in the landscape. The infrastructure left on site is rusting and cannot be used anymore. The herder further mentioned that compression of the ground along the accommodation way and destabilisation of slopes around the mine are increasing soil degradation.

Local people do not know the kind of minerals that are found in their area and if the mines will be in use again, but since many expeditions came in these areas to see the mines they are sure that there must be huge deposits of this important resource. Participants at the workshop for Sustainable Development of the Tajik Pamirs mentioned that the minerals constitute an important resource of GBAO but until today may not really be utilized due to a lack of infrastructure such as roads and machines.

Concluding remarks

The documentation of the use of resources inside the TNP points out that even though few people inhabit the TNP permanently, large parts of the population of the Tajik Pamirs are at least occasionally dependent on the resources inside the park. This makes consumptive use of natural resources very complex and cause different impacts on the natural environment of the TNP.

Pastures are widely distributed inside the TNP and seasonally used with different intensity. The use of pastures is not only determined by the supply of grassland but also affected by socio-economic aspects. Poor herders cannot afford transport costs to remote areas, thus especially the pastures around settlements are intensely used, while pastures in remote areas are not in use anymore. This development leads to overgrazed pastures and intensified erosion, even though the actual livestock numbers are much lower than during the Soviet era (cf. figure 3.15). On the other hand, remote pastures are affected by a decline in plant diversity, since moderate grazing of livestock benefits the growth of small herbs (selection). The absence of imported winter fodder after the collapse of the Soviet Union and the limited mobility of herders both caused an intensification of the use of hay fields and winter pastures. Herders as well as members of various actor categories assessed winter pastures as the critical element in livestock breeding since they decide the total number of animals that can survive the severe winters. Therefore any further degradation of winter pastures or their abolition due to strict protective measures would both lead to an intensified degradation on the remaining sites and limit an important economic base of resident people.

The access to alternative **sources of energy** is very limited in the Pamirs and thus people use what is available on site. The collection of woody sub-shrubs results not only in soil degradation, but also in a drastic reduction of the fodder supply for both livestock and wildlife. Soil degradation undermines the natural potential for a recovery which is already very limited due to harsh climatic conditions and a short vegetation period. Furthermore, it negatively affects plant diversity by supporting the growth of few thorny plant species which replace herbs and sub-shrubs.

Agriculture makes up a very small pattern of utilisation within the TNP. Due to limited infrastructure and financial support, only few water channels were built in the last years and the area under cultivation remained almost the same since the collapse of the Soviet Union. However, its impact on nature has to be assessed with respect to downstream areas. Agriculture in this region is strongly dependent on

watering, which may cause salination on site as well as accumulation of fertilizer further downstream.

Wildlife is affected in two different manners. Intense hunting activities by members of different actor categories lead to a decline of species included into the Red Data Book of Tajikistan. Affected are in particular the Marco Polo sheep. This species is also used by foreign trophy hunters. In addition, wildlife is affected in an indirect manner by the use of other natural resources. Collection of woody subshrubs and intensified grazing of livestock deprive ungulates of important forage and limit their habitat. Border fences cut their migration routes and hunting evict them from their natural grazing grounds.

More and more, **water** becomes an important resource of the Pamirs for agriculture in the lower valleys and further lowlands as well as for power production for an international market. Experiences with the already built hydro power plant in the Vaksh valley showed that such huge projects bring not only electricity for parts of the population, but also cause ecological and social problems. Storage lakes flood agricultural land that is in short supply in the mountains and resident people are forced to resettle in other areas (Badenkov, 1990). Already endangered habitats, such as flood plains and hay fields, may be negatively affected because minimal changes in water levels and drainage have severe impacts on the highly adapted vegetation. Suspended solids brought in with the rivers lead to a reduction of agricultural land and limit the potential of power generation.

9.2 Conservation of resources within the TNP

One aim of the TNP focuses on nature conservation (cf. 8.1.1). To be able to assess the conversion of this goal and its possible impact on residents inside the TNP, actual activities of different actor categories related to the conservation of resources are discussed from different points of view.

At first, nature conservation within the TNP as it is realised by the state in terms of law, funding, organisation, and management is analysed (subsection 9.2.1). In a further step the management of natural resources as it actually conducted by the state is outlined (subsection 9.2.2). Subsection 9.2.3 discusses the appraisal of resources by resident people. The awareness concerning the state of natural resources and the practices of different actor categories realised for the conservation of these resources are outlined.

9.2.1 The TNP as an instrument for nature conservation

Legal position of the TNP

Legal tools for the use and conservation of the environment were established according to the Constitution of the Republic of Tajikistan on November 6th 1994 and assigned by the Government. They mainly focus on nature conservation in general, on land charges, water, wildlife and resource use (NABU, 2002). The laws which are most directly related to conservation include the law on nature conservation (1994), the law in conservation and use of wildlife (1994), the law on protected areas (1996) and the different codes on land, water, and forest¹³.

The status of the TNP is defined by an act of state. In 1992 the Cabinet of Ministers of the Republic of Tajikistan enacted the decree on the establishment of the TNP (NABU, 2002). Due to the disorders following the civil war, this decree was not implemented. A new effort to establish the TNP was made on 15th July 2001. This decree outlines the provisional area of the future park on the state land

¹³An overview of laws, acts, codes, resolutions and governmental decisions related to nature conservation and the TNP is given in the annex.

reserves¹⁴ and specifies its main tasks as listed in section 8.1.1. No special laws focusing on protected areas and the TNP have been established¹⁵. Since the zoning of the park is not yet done, possible future regulations for these areas are not known or enacted. From this it follows that the same rules are in force outside as well as inside the TNP.

The preparation of new laws by the government is seen as a problem by some members of the TNP authority since the government does not clarify if new laws are compatible with existing ones from the Soviet period. Thus their enforcement is not always feasible.

Members of different actor categories comment that the legislation concerning nature conservation is not working proper, laws are not adapted to the new situation inside protected areas, and they don't cover all important matters. A member of the TNP authority concretised that protection of the territory is not working proper nowadays and people do whatever they want. He hinted at the ongoing corruption when he stated that people can bribe and even though a law is existing, the rules are not the same for everyone.

In the remote areas of the Pamirs it is obvious that even though legal regulations concerning the use of natural resources inside and outside protected areas are existing, they are nowhere enforced. This is caused by several circumstances: the huge dimension of the area makes it almost impossible to control the human activities all over and a lack of finances constricts the infrastructure of Nature Protection Committees and their salaries. At the moment hardly any alternative sources of income and energy are supported and thus local people are dependent on what is available on site, no matter if it is protected or not.

Management category

Until today the TNP does not correspond to the category II (national park) in the IUCN classification scheme of protected areas. Extractive resource uses such as trophy hunting are not compatible with this management category (cf. appendix F). However, members of the TNP authority always mentioned that their management concept is directed to a national park. These remarks point out that their understanding of national parks differs from international standards but is closely linked with the Soviet system of protected areas.

The TNP does not have a management plan in the form applied in western countries. Although rudimentary steps to work out a new and modern comprehension of conservation of natural resources and biodiversity may be identified within the TNP authority, in general the management of natural resources is still understood the same as during the Soviet era. Soviet national parks only had statutes worked out by researchers and other specialists. Such statutes included detailed descriptions of natural resources, cultural heritage, and suggestions for further development. Most of these ideas were not supported by local residents because their interests were not incorporated (NABU, 2002). During this time a cooperative approach for the management of natural resources was assessed as harmful for the quality of the protected area and a strong legislation supported by rigorous law enforcement was seen as a good option for long-term conservation by the state institutions (Krever et al., 1998).

Funding of nature conservation within the TNP

The lack of money is omnipresent in state agencies and rated as main reason for the limping process of implementation of the TNP by members of the actor categories

¹⁴All land of Tajikistan belongs to the state.

¹⁵The land code from 1996 that regulates land use and other laws concerning natural resources are valid for all Tajikistan and therewith also include the protected areas.

'administration', 'scientists' and 'TNP authority'. Members of the TNP authority explained that the only chance to realise the TNP exists when they get international support for its financing and further proceeding. Therefore, attempts are undertaken to include foreign agencies into the planning process. However, until today there is no clear organisation of financing of the TNP. According to NABU (2002), basic financing is actually carried out at the expense of the public funds and makes up 0.1% of the national income.

The most prominent way that was mentioned to finance the TNP as well as other nature conservation projects are the revenues from international hunting, but this is not functioning since the money never arrives at the regional or even local level¹⁶. Employees of Nature Protection Committees confirmed that they do not get financial support to realise their tasks from the hunting business. However, an employee of a NGO stated that the money from international hunting is in fact not directly invested into projects concerning nature conservation as it is planned, but partially used to pay salaries of Nature Protection Department. This is seen as delicate because exactly this department should supervise the activities of the hunting companies.

According to the TNP authority, no visitors of the TNP have to pay a park fee at the moment. Income from the sale of special tourist-visas for GBAO is not used for nature conservation matters.

The problem of finances superposes other troubles of the TNP. The statements from the different actors on the regional and national level give the impression that once this problem is solved, all other hindrances would be settled as well. In fact the lack of money limits research activities needed to update the basic information about the area and the inventories of threatened species, complicates the preparation of an adapted management plan, reduces the salaries of employees to a symbolic character¹⁷ and limits equipment so that the scope is constricted to a minimum. Nevertheless, even if all these matters are dependent on financing, it is to assume that funding alone will not make up the answer to these deficits, as the following discussions should point out.

Organisation structures and cooperation

The TNP is officially managed by the Ministry of Nature Protection which is divided into numerous administrative and structural sub-units (cf. GRIDA, 2003). However, the organisational structure of the TNP spans several administrative levels. Figure 9.12 illustrates that today only institutional actors are involved in the organisation of the TNP¹⁸. Private institutions and actors on the local level are not included. Hunting companies take in an important position in the management of wildlife resources and in financing their conservation, however they are not directly involved into the organisation of the TNP. Wildlife, especially large mammals, are crucial for the TNP since they promote this project with respect to conservation but also

¹⁶An average hunting trip for a Marco Polo ram takes between 3 to 7 days and costs about 25,000 US\$. The final sum however is dependent on the size of the trophy. According to information from ACTED, this money should be split by law as follows: 40% for the government of GBAO which should invest it in nature conservation issues and development projects on the regional and local level. 32% are reserved for the company that provides the hunter (mostly U.S. companies), 16% for the hunting firm (local, national or Russian), used for organisation of the trip, car, guides, food, visa and permissions. The rest (12%) is reserved by the hunting company for non-official payments (to get more licences) and management of the hunting area (information from ACTED, 2001).

¹⁷Employees of the local Nature Protection Committee reported to earn between 3 and 18 Somoni (about 1 to 6 US\$) per month.

¹⁸Due to the clearness the relations between the TNP and the state institutions on the national level are not specified. These institutions are similar linked with the TNP as the institutions on the regional level.

regarding tourism development¹⁹.

The TNP authority is not separately shown in this figure since the national parks of Tajikistan and thus also the TNP are maintained by the Ministry of Nature Protection, the protected forests and the *zapovedniky* are supervised by the Forest Association (*Tadjikles*). However, also other institutions are involved into organisational matters concerning the TNP although employees of the TNP authority mentioned that actually it is still open what group, institution, and organisation will play which role within the TNP.

The Academy of Science takes in an important position in the organigram since it provides various Ministries and Departments with scientific information that is assessed as important for further planning and realisation of the TNP. Information on land use is composed by the Land Use Department on various levels. Supervising of activities inside the TNP and management of natural resources in general is organised by the Ministry of Nature Protection and delegated to its regional and local offices²⁰. All institutions involved in the organisation of the TNP are authorized to organise conservation of natural resources also outside the TNP. Since resource conservation is organised and managed by the same institutions inside as well as outside the TNP, hardly any difference exists between the landscape ecosystems.

Organisational structures of the TNP on the local, private level are missing today. Regional headquarters and local park offices are not yet established. Therefore the TNP authority delegates all work on this level to the *rayony*, as an employee of the Land Use Department affirmed. A member of the TNP authority explained that competences passed on lower levels foster the cooperation among all actor categories. This organisation should allow the exchange of information in a two-way process. He mentioned that it is not only important to inform the public about the TNP, but to get the needed information wherever it is stored to use it for the realisation of the TNP. Thus the park authority is not only dependent on different institutes, but also on local people and their knowledge in resource management. Another member of this actor category supported the theory that information concerning the TNP is trickling down all the way from Dushanbe to the local administration and thus local people are informed about the TNP. However, as investigations in other actor categories clarified, this mechanism is not functioning. The *hukumats* however pass the task of information to the local Nature Protection Committees. These on their part delegate the responsibility for the TNP to their superior offices on the regional and national level. Thus they don't make an effort in providing the public with information about the TNP.

Only few people work directly for the TNP. When asked about the staff of the park, local people often mentioned all employees of Nature Protection Committees. However, this is not correct since they have no special task concerning the TNP yet. Only one person from the GBAO is working in the TNP authority, the other 30 employees are coming from Dushanbe and other regions and seem to have a poor knowledge of the Pamir Mountains. Most of them are former employees of the Ministry of Nature Protection. Even though local people are not directly involved into the organisation of the TNP, they already occupy different jobs related to nature conservation in general. These people are employed by Nature Protection Committee or hunting companies and not directly by the TNP or the regional administration. Most of them only work part time for Nature Protection Committee and are dependent on other sources of income. They are not paid for their job as minder of resources and thus don't take it serious. A herder living in Madyan valley reported that staff of Nature Protection Committee recently asked him to do an

¹⁹Especially the Marco Polo sheep are handled as flagship species by the TNP authority, tourism agencies and conservationists.

²⁰The control of resource use inside the TNP is not illustrated in figure 9.12 since it is only done theoretically but not realised due to a lack of equipment and staff.

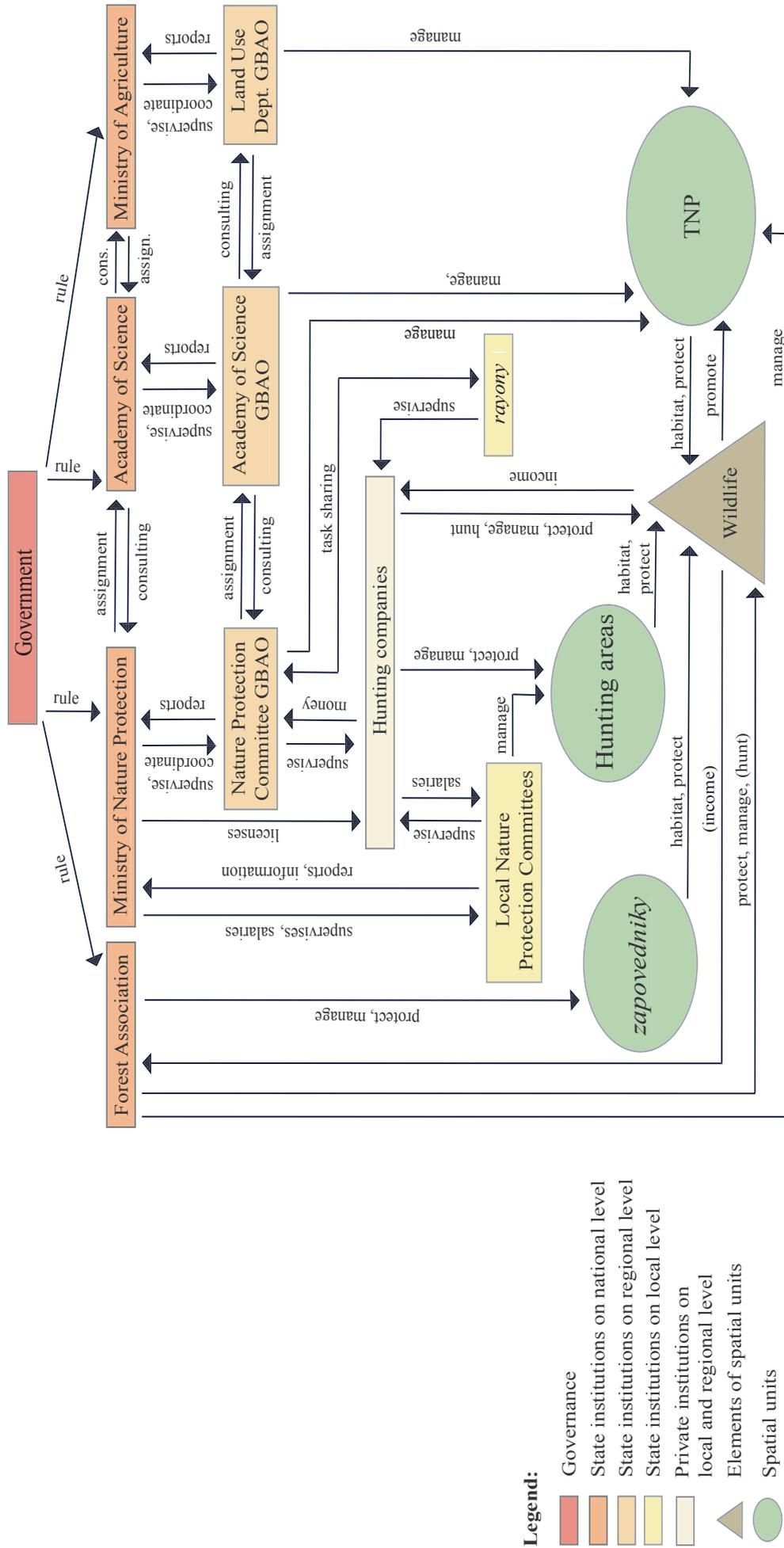


Figure 9.12: Organigram of institutions dealing with the TNP. The links between the state institutions on the national level and the TNP are not shown, but are similar to the links between the state institutions on the regional level and the park (based on interview data 2002, own assessment).

extra job as forest guard. His task is to report illegal activities in the forest to the office in Murgab, but he does not have to care about illegal poaching. However, this herder only lives close to the forest in winter, in summer he stays on the high pastures. He does not get any salary for his work, the only profit he may have is 20-30% of the charge if he catches a person cutting wood illegally. Since he has no identification card he cannot verify his job to any wood cutter.

Currently, efforts are undertaken by the TNP authority to involve actor categories of the international level into the organisation of the TNP. First steps have been undertaken to enlarge the TNP to the territories of Kyrgyzstan and China and to coordinate projects focusing on nature conservation within these countries. However, the participation of international NGOs and research institutions is still marginal. An employee of a NGO and several foreign scientists mentioned that many of the projects implemented by NGOs are running parallel to the project of the TNP or even compete with it, thus their input is not really of a great help. International or national actors on location are mostly confined to hunting companies, but their managers are not involved into the organisational process concerning the demarcation and zoning of the TNP.

The number of stakeholders that are effectively included into the planning process of the TNP is limited. However, a split-up of competences and a lack of coordination and information among the numerous departments as well as within single institutions complicate the organisation (cf. figure 9.12). According to employees of various institutions, meetings to exchange and update information among the different levels and groups are very seldom and always include the same persons but not all institutions. The regulations among the departments are very convoluted or illogical, as an employee of a state institution named it. He explained that while the Forest Association is responsible for the protection of game species, the revenues gained by the selling of hunting licences for this species run to the Ministry of Nature Protection. Like this, the Forest Association can hardly finance its activities needed for the protection of game species²¹. Until today the TNP does not coordinate such activities inside its territory but extends the range of institutions that are involved into the management of natural resources. A member of the Academy of Science complained that until now there is no contract between the Academy of Science and the TNP and thus the expected contribution of the Academy is not defined yet nor is the collaboration between these institutes regulated. According to a statement of a NGO employee, the organisation structure of the TNP hinders the realisation of the existing rules and laws concerning nature conservation and does not contribute to improved protected areas.

9.2.2 Resource management by state institutions

The rough outline of the park area of the TNP was drafted by the Academy of Science and then discussed with the Land Use Committees, the *rayony* and regional authorities, as an employee of Land Use Department explained. This process of demarcation was very intricate since the existence of nine settlements inside the TNP and their membership to five different *rayony* complicated the procedure (cf. figure 7.8). However, a member of the TNP authority explained that most permanent settled area was excluded from the park to simplify the organisation and guarantee best options for nature conservation and low human disturbance. Since the final external boundary of the TNP was still negotiated in 2002, the zoning was not yet determined. The characteristics of zones, their location and management was still

²¹In the past, the Forest Association managed the *zapovedniky* which were sometimes used as hunting grounds, thus they could improve their finances. According to information of hunting companies, the Forest Association is not running a hunting business comparable to the private companies today, thus the hunting and income from hunting is put in parenthesis.

discussed among the institutions involved in the organisation of the TNP.

A precise concept of resource management inside the TNP is actually nonexistent. Unheeded the establishment of the TNP, management of natural resources inside the TNP is conducted from the same institutions as outside and thus does not differ from it.

Grassland

The huge area of rangeland is only marginally managed by local institutions that are not supervised by the TNP. Farmer associations manage the use of hay fields and winter pastures. In general, livestock is not allowed to return from the high pastures to the winter pastures before all households are done with mowing.

The only condition for the use of summer pastures in Kokuybel affects a more or less binding schedule, but it is not as strict as under Soviet ruling when herders had to follow a clear itinerary for every pasture. To prevent winter pastures from overuse, herders often had to stay on high pastures until December. Today people with smaller herds stay in one place all summer and return earlier to the winter pastures. In Yashilkul area the pastures are mostly distributed by the *gozkhoz*. So called 'zootechnicians' analyse the quality of the pastures in spring and are responsible to distribute the pastures according to the number of livestock²². Only one area is known where the use of pastures and the number of livestock is regulated today, but this is not done inside the TNP and supervised by a state agency, but by a private hunting company outside the TNP. The few herders living in the area south of Tsheshdebe are not allowed to use all pastures around their *jailoo* to guarantee enough fodder for wildlife. For this restriction herders become substitutes in form of hay or others from the hunting company.

To ensure the conservation of flora, rare and endangered species are listed in the Red Data Book of Tajikistan. However, the information of this book is out of date and new information about the distribution, state and the condition of the habitat of plant species is missing.

Wood and woody sub-shrubs

Forests are managed by the *Tadjikles* after a system of protection established under Soviet ruling that is still in force today. All forests of Tajikistan are divided into three groups which stand for different management objectives. The forests of the Pamirs are allotted to group I, a strict management category²³. However, the forests of group I are divided into 23 different sub-categories and thus the range of management is wide. Wood harvesting is allowed in some special sub-categories of group I or with special permissions (NABU, 2002). A local tradition of the Pamiri people for example demands from the parents that they build a house for their son when he



Figure 9.13: Intensive grazing by livestock causes a decline of vegetation and degradation of pasture land. This is a problem on pastures located close to villages or on pastures insufficiently managed by a farmer association or a state farm (Photo: R. Lüthi, September 2002).

²²In the past, there existed a special allocation of state livestock. Yaks and sheep pastures were separated on the pastures. Weak animals stayed in the *sovkhov* all summer.

²³Forests of Tajikistan are classified in three groups. The main objective of forest management in group I is to maintain the protective function of the forests, in group II commercial use is restricted but not prohibited and in group III the main management objective is commercial forestry.

marries. A permission for cutting wood for a house is then issued by the Forest Agency located in Khorog. Botanists from the botanical garden in Khorog stated that people cutting a poplar for building a house have to replace it. However, this seems not to be done by all people. Since the forest area included into the TNP is very small, a special management of these locations by the TNP would hardly improve the situation of forested areas inside the Pamirs.

The use of other plant resources is only regulated by law but not supervised in the field. Staff of Nature Protection Committee Murgab stated that the prevention of wild *teresken* collection is one of their most urgent tasks. However, since they are hardly ever in the areas where *teresken* is gathered, they cannot intervene actively. When asked about the people selling *teresken* on the bazaar, they mentioned that this is only done by the very poor families and since they have nothing else to live on, the authorities bend the rules and do not punish them. A member of an international organisation explained that as a consequence of weak controls, medical plants and woody sub-shrubs are collected without any state or private management inside as well as outside the TNP.

Wildlife

Wildlife management is complicated by the engagement of diverse actor categories. The different state agencies involved are often influenced by the interests of private persons, companies and international organisations. Especially the management of endangered species that are very profitable in international business is a delicate topic on both, the national and the international level. Wildlife management by state agencies is limited to a minimum and only supervised from Dushanbe. A ban on hunting for special species exists, but due to a lack of control it is not enforced, as a member of the TNP authority mentioned. Local people have no possibility to buy a hunting licence for Marco Polo sheep and some other endangered species and thus are not allowed to hunt them. Limited numbers of several game species, such as long tail marmots, wild boar, Asiatic ibex, stone marten, ermine, hare, fox, pigeons, Himalayan snow-cock, partridge, sandpiper, and waterfowl may be hunted during special periods by residents.

Similar to rare and endangered plant species, updated inventories about most wildlife species are missing. Thus the status of some animal species is not clarified and the number of hunting licences that are sold every season are not adapted to the size of the respective populations. Even though the census data concerning Marco Polo sheep varied much during the last 10 years, the number of licences sold for trophy hunters remained more or less stable²⁴.

Hunting restrictions seem to be only existing for residents, but not for tourists – provided that their budget is adequate. Today there is only one hunting company active inside the TNP, but it is still running its business without any restrictions. Nature Protection Committee explained that trophy hunting is officially controlled via the number of licences that are sold. However, statements from staff of hunting companies and employees of NGOs alluded that hunting activities are not supervised by Nature Protection Committee because their salaries are paid by the hunting companies. As a result, hunting companies shoot more animals than are officially allowed by the number of licences, as different statements of hunting guides bespoke.

9.2.3 Handling of resources by local actor categories

The following remarks focus on activities of actor categories other than state agencies related to the handling of resources. The handling of resources is strongly influenced

²⁴For more information concerning census data see WWF, 2002.

by the awareness of different actor categories versus these resources. Thus, the perceptions of resources and the attitudes towards conservation should be highlighted.

Grassland

Herders often stated that enough fodder is growing on the high pastures so they do not worry about its conservation but use what is existing. Some local residents were of the opinion that resources can be used as long as they are available and alternative solutions only have to be considered when the resource is going out. A member of the actor category 'international organisations' ascribed this attitude to the conditions during the Soviet era when people were provided with almost everything coming from the lowlands and local resources were only marginally used. Thus local people did not have to worry that natural resources could run out. However, mainly rich herders who use the same pasture year by year showed a certain awareness towards sustainable use of resources. They explained to equally graze the pastures and to prevent an over-used pasture from grazing for a certain period so it may recover.

Generally, conservation interests of local people are only pronounced concerning scarce resources. Herders stated that they are taking care about their hay plots very carefully and prevent them from being grazed in summer so that they get as much hay as possible.

Compared with local resource users scientists are well aware that the vegetation suffers from improper use. A botanist stated that he is concerned about the future of the grassland area, because local people overuse vegetation and as a result it is disappearing. He explained that during the Soviet era the use of pastures was regulated, but today livestock is grazed everywhere and since there is no rest period for the vegetation, degradation is increasing. Another botanist however mentioned that due to the low numbers of livestock there is no need for regulations anymore. With regard to the drastic decline in livestock numbers after independence this assessment may be warrantable, but a look on the changed spatial dispersal of livestock shows that the influence on vegetation is much more complex. Vegetation is not only dependent on numbers of livestock but also on its spatial and temporal distribution. According to the information of a scientist, the dry climate and the short vegetation period in the Pamirs cause a regeneration length of 10 to 15 years for degraded pastures and *teresken* sites. Whereas a herder stated that a break of one year is enough time for an overused pasture to recover.

According to an employee of a state farm, unadapted pasture use is the result of the privatisation of livestock after independence. People who were not working in the farming sector during Soviet era were not familiar with ecological processes on pastures and thus paid no attention to signs of degradation. However, he also stated that due to the difficult economic situation people only focused on short term benefits and had no means to assess if their handling is ecologically sustainable or not.

Herders do not seem to feel responsible for the state of the pastures they use. A herder stated that even though overgrazed pastures occur, he is not responsible for that because the pasture and the number of livestock he has to herd is assigned by managers of the *gozkhoz*. However, herders know that the quality of the pastures is dependent on the extent of grazing by livestock. Misuse of pastures may be caused by



Figure 9.14: This intensely grazed pasture cannot recover during the time it is not used from autumn to spring (Photo: R. Lüthi, September 2002).

intensive grazing as well as by under-dosed grazing. Vegetation on overused pastures is replaced by thorny plants. Vegetation on pastures that are not in use anymore grows up to 40 cm and becomes very thick, so the young grass has no chance to grow anymore. Both sorts of pastures are stated to be of low plant diversity and thus of low quality. According to herders, the best fodder quality and quantity may be found on pastures that are moderately grazed.

Wood, woody sub-shrubs and manure



Figure 9.15: Truck loaded with *teresken* brought down to the winter house (Photo: R. Lüthi, September 2002).

Many local people mentioned that they worry about the future of *teresken* and *shivaq*, since this are two of the few available sources of energy. Because the ratio from parts above surface to subsurface roots is about 1:10, the whole plants including the roots are dug out of the ground. Together with a slow growth rate²⁵ this handling limits the option for regeneration of overused sites. Old and big plants are reported to grow mainly on slopes and ridges and when removed, the soil on this sites becomes instable, increasing the danger of erosion and destabilisation.

A botanist explained that on overused areas around settlements erosion proceeds, the soil dries up, mineral sources are reduced and forage for livestock is limited. People are well aware of this problem and explained to collect only the old plants and use them just to start a fire, while afterwards they use mostly manure that is widely available on the *jailoo*. Manure is not used to prevent *teresken* from overuse but because it provides a good heat-

ing value and is easy available. However, people on remote high pastures stated that there is enough *teresken* available since hardly no other people come up to their area to collect it for selling it on the bazaar.

Due to their limited habitat along the rivers, forests are even more under pressure than the widespread *teresken*. Local people are well aware that the sparse woody resources are vanishing. A forest guard in Madyan valley²⁶ ascribed this situation to the human activities that are not under control any more. He explained that during the Soviet era there was more forest in Madyan valley, spreading close to the centre of Murgab. This forest was well protected, but after the collapse the control faded and especially people from Murgab started to cut wood like fools.

Different NGOs are planting trees in Madyan every year since grazing of livestock makes a natural regeneration of the forests impossible. The small poplars planted were in a bad condition, many of them were withered due to lack of water. Guards only keep illegal loggers out of such forests, but livestock is often grazing in these areas and eats parts of the branches. Even though NGOs makes a great effort, forestation seems to be a difficult task in this altitude.

In the western valleys wood is more common but not well protected as well. Employees of the forest guards can hardly monitor all illegal wood cuttings in the fragmented forests. All wood cutting needs a permission, but the acquirement of such a permission is reported to depend on the amount of money one can offer to the forest guards and is not fixed according to ecological conditions.

²⁵A plant of *teresken* with a diameter of about 50 cm is 25 to 40 years old.

²⁶This valley located close to Murgab centre is the only place where small trees are growing in Murgab *rayon*.

Wildlife

Statements of interviewees concerning wildlife conservation mainly focused on Marco Polo sheep. Besides its value as source of meat, this species is assessed as a cultural object that represents beauty, strength, cleverness and power. Marco Polo sheep attract awareness of all actor categories from the regional to international level. Therefore the following remarks focus on this species.

Similar to *teresken*, almost all actor categories are aware of the decline of Marco Polo sheep²⁷. The population of Marco Polo sheep is decreasing faster since independence. Several people from different actor categories assigned this to increased illegal hunting activities during the civil war. At that time many people got a gun and thus could go hunting, while during the Soviet period only herders who had to protect the livestock from wolves had a gun. The guns have never been collected after the civil war, as an employee of a NGO stated. Some actors seriously worry about the future of the Marco Polo sheep population. A local resource user explained that every element of nature is connected with each other like in a chain and thus the loss of one element will affect the others in a negative manner. However, awareness alone does not induce a change in behaviour because many actor categories attribute the cause of these changes to others.

Local residents from all levels hunt regularly and often do not pay attention to the existing law, the hunting seasons, and the sex or the age of the animals they shoot. Only few hunters told that they would not shoot ewes of Marco Polo sheep in spring to save their offspring. Generally, local people do not implement any measures to protect wildlife resources such as Marco Polo sheep from a ongoing decrease even so they are well aware of its causes.

Some herders explained that due to human disturbance Marco Polo sheep are grazing at higher altitudes and would only come down in areas with no disturbance by men and livestock. A member of the actor category 'local authority' mentioned that the TNP should hurry up to be established proper because otherwise no Marco Polo sheep will be left. He reported that illegal hunting is still popular and conducted almost as intensely as during the civil war. However, most herders argued that the reasons for disturbance of Marco Polo sheep in their area are not or not only man-made. They constituted their statement with reports about observations of Marco Polo sheep grazing close to livestock on high pastures²⁸. According to their remarks, Marco Polo sheep are mainly disturbed by wolves. All



Figure 9.16: Livestock crowds ungulates from their feeding grounds. As soon as the herder appears with his sheep, dog and donkey, the Marco Polo sheep ruminating on the slopes run upward, escape behind the ridges and leave only white traces as visible on the slopes (Photo: A. Haslinger, August 2001).

²⁷Different census done during the last 50 years show that the numbers decreased from about 80,000 animals in 1962 (Sapojnikov G.N.) to 9,410 animals in 1991 (Helicopter census, Ministry of Nature Protection of the Republic of Tajikistan) and no more than 3,000 animals in 2000/2001 (census from car and on feet, coordinated by the Pamir Biological Institute and the Nature Protection Committee) in GBAO. According to a census done by A. K. Fedosenko in 2000, the number of Marco Polo sheep should be about 13,000. Own observations lead to the presumption that the numbers given by Fedosenko are more realistic than the one of the Pamir Biological Institute and the Nature Protection Committee. For detailed information concerning the estimated numbers of Marco Polo sheep from the 1960s to 2002 see WWF, 2002.

²⁸Marco Polo sheep are reported to mix with domestic sheep and goats on high pastures, but not with yaks.

local people stated that wolves became more numerous in the last 10 years and thus are a big threat not only to livestock but also to ungulates²⁹.

Wildlife is not only intensely used by local people but also hardly protected by staff of Nature Protection Committee and farmer associations. Even though hunting companies also shoot *arkhar* for own consumption and thus limit their numbers, they are the only actor sub-category that successfully manages wildlife in terms of conservation. Some of the bigger hunting companies regularly carry out censuses on Marco Polo sheep and other species inside their area. This is sometimes done in cooperation with the Safari Club International (SCI) and the US Fish and Wildlife Service, as participants of the PSP Workshop explained. Due to these activities, the hunting companies exactly know the number of the Marco Polo sheep population within their area, the quantity of trophy sized rams and the number of offspring. Hunting companies can control poaching very successfully. A comparison between Muzkol area inside the TNP and the area south of Murgab allotted to a Tajik hunting company point out that the population of Marco Polo sheep in the hunting area is more numerous than the one inside the TNP. According to the census data collected by WWF in winter and spring 2002 (cf. WWF, 2002), the density of Marco Polo sheep in the area south of Murgab, from Chestepe to the Afghan border, is 18.4 animals per 1,000 ha and thus much higher than in the area around Muzkol sanctuary (6.2 animals/1,000 ha) and Akjilga (9.6 animals/1,000 ha). Most area in Muzkol is neither managed by a hunting company (except Beljandkiik) nor by Nature Protection Committee which cannot afford to undertake field inspections from Murgab. In addition, several local hunters and hunting guides mentioned that the Marco Polo sheep population inside the hunting area close to Chestepe is very healthy, indicated by a high number of offspring per year and ewe and a high number of trophy sized rams. The state of this Marco Polo sheep population is attributed to regularly controls by well paid and equipped staff³⁰ of the hunting company, special devices such as nail boards that prevent poachers to enter the area, and a control of livestock numbers in the area. However, of course the state of Marco Polo sheep is not only dependent on the amount of disturbance by man and livestock and the control of poaching but also on the characteristics of the habitat. Therefore it has to be added that in addition to the active management of wildlife in this hunting area, the habitats of Marco Polo sheep located between Chestepe and the Afghan border provide more grass than in the dryer area around the river Kokuybel. This is basically caused by small scale climate and geological characteristics, as a botanist explained.

Different actor categories considered feeding of Marco Polo sheep to be an important issue for the conservation and enhancement of their population. During the Soviet period wildlife was fed at several locations. Today staff of Nature Protection Committee and hunting companies sometimes install salt-licks. Employees of a hunting company explained to feed small rodents and *ulars* in winter with hay, but not Marco Polo sheep since they don't need extra feeding. Scientists stated that feeding of ungulates is not necessary for their survival. In contrary, it may make up a danger for them and influence their spatial behaviour negatively. Namely salt licks cause a concentration of ungulates around such feeding places independently from the quality of the surrounding habitat, leading to high grazing pressure and erosion. Furthermore, populations attracted by salt licks are reported to show a limited migration which makes them to an easy target for wolves and hunters.

Trophy hunting is not assessed as problematic for the wildlife population by many

²⁹During the Soviet era gamekeeper actively regulated the number of wolves and herders got a gun and ammunition to shoot wolves on the high pastures. However, many of these ammunition was used to shoot a Marco Polo sheep instead, as a herder explained. Today wolves are not killed systematically due to missing staff and ammunition.

³⁰Needed are namely cars, gasoline and radio.

people because licences are limited. However, due to missing census information the arrangement of licences is not adapted to the actual population size, as an employee of a NGO explained. Furthermore, it is obvious that more animals are hunted than allowed by licences. Even though the number of animals killed by local resource users exceed the number of killed trophy animals, sport hunting may have a negative impact on the Marco Polo population and harm their gene pool over just a few years. This concern was only mentioned by foreign scientists but it may be affirmed with a study done with one sheep population in Canada. This study shows that phenotype-based selective harvest like trophy hunting can have important implications for sustainable wildlife management if it targets heritable traits such as ram weight and horn size³¹.

Most local people are well aware of the value of wildlife resources. Local resource users however only know what is dealt on international markets but they have no idea about the prizes. A member of this actor category reported that he tried to sell a pelt of a snow leopard for years. This example points out that the access to markets seems to be limited for local resource users. However, threatened animals are hunted inside the TNP. A member of the park authority explained that people who killed a snow leopard explain that they had to kill the animal because it attacked them. In most cases this is not true since normally these animals do not attack human beings the way wolves may do. With respect to the limited scope of local resource users it may be assumed that the people involved in this business stem from other actor categories on higher levels.

Only one place is known where wildlife is strictly protected by local people. A legend tells that long time ago prophets travelled the Pamirs and left their omen at the lake Akbalyk (white fish), located close to Alichur. Thus the lake, which is full of fishes, never freezes even though there is no hot spring and temperatures fall far below zero in winter. Akbalyk is a holy place and fishing there is strictly forbidden. This example shows, how cultural perceptions may have an impact on the use of natural resources.

Water

Stresses on the environment concerning other resources than pastures, *teresken* and wildlife were only very seldom mentioned by local or regional actor categories. Only one local man living close to Murgab centre mentioned that the water quality became bad because the water from bathrooms runs directly into the river. However, no state agency pays attention to this since it is not rated as urgent problem.

Concluding remarks

Protective measures concerning natural resources strongly differ between state or scientific institutions and local resource users. The former represent formal aspects while the latter established informal arrangements within their actor category to regulate the dealing with certain resources.

Due to the difficult socio-economic situation and chronic budget deficits, the **Tajik government** does not consider the solution of ecological problems a priority. This shortcoming has to be based on the missing understanding and assessment of the value and benefits of biological diversity on the state level (as well as on other levels). As a consequence, biodiversity conservation is not estimated as an

³¹Trophy-harvested rams of this study were of significantly higher genetic 'breeding value' for weight and horn size than rams that were not harvested. Rams of high breeding value were shot at an early age, and thus did not achieve high reproduction success. Declines in mean breeding values for weight and horn size therefore occurred in response to unrestricted trophy hunting, resulting in the production of smaller-horned, lighter rams, and fewer trophies (Coltman et al., 2003).

immediate contributor to the welfare of the state and the establishment of protected areas is little supported.

Today the TNP only exists de jure. Statutes allowing its creation have been signed, a location of the park has been selected, but delineation of the borders in the field and consultations with local authorities and land users have not yet taken place. The park features a poor planning and lacks documentation, scientific monitoring and law enforcement. Facing these **shortcomings**, the contemporary TNP may be assessed as a paper park.

The **institutional basis** of activities to preserve the environment is weak. The authority to manage the TNP is scattered among ministries, agencies, and committees, thereby diminishing the efficiency of what little financial resources are available for conservation. Certain state departments occupy double functions and simultaneously control certain natural resources and take advantage of its exploitation, as is illustrated in figure 9.12. Nature Protection Committees for example should supervise the activities of hunting companies. However, their salaries are not paid by the state but with incomes of the private hunting firms. As a consequence, in fact international hunting controls the Nature Protection Committees in the Eastern Pamirs. Budget deficits as well as the splitting of competences between numerous state departments hamper coordination among the institutions and an efficient organisational structure concerning the TNP. More generally assessed, environmental management lacks a comprehensive, holistic approach. Only few employees of the state administration could characterise their own tasks in general, in cooperation with other institutions, and concerning the TNP. This highlights the deficit of information which is not only present with respect to the TNP, but may be found among many departments. The badly marked-off responsibilities lead to a lack of transparency on the different administrative levels and between them. Furthermore, the staff of these local institutions is spread thin. The four people working for Nature Protection Committee Murgab are not able to control and manage an area with almost the size of Switzerland. However, they are expected to implement the full range of tasks delegated by the superior departments. The TNP authority is but one additional institution and could not yet realize its function as a coordinating superior party to unify the administrative system. Today the TNP is neither central nor local organised. Although more than half of the area of the TNP is located inside Murgab *rayon*, no representative of this region is included into the planning process of the TNP. It has to be assessed as difficult to reorganise these structures as long as many former middle-management personnel retain their jobs since they apprehend other institutions still as rivalry for funds and competences.

Recent establishments of protected areas were always accompanied by rigorous scientific justifications. Today the means to carry out actual research are missing. Thus the **scientific community** cannot accomplish the expected inputs used for decision making in the planning process of new protected areas. The Red Data Book of Tajikistan for example is not yet updated and thus is not a reliable data base on which to decide how to include the actually most endangered species into the TNP. As a result of the missing actual scientific data, the options of the TNP authority to justify the establishment of the TNP opposite the society are limited.

Scientific work as well as other duties related to nature management are more and more split among different actor categories. After independence, NGOs became active in monitoring of resources and other work that was formerly conducted by the Academy of Science or state departments. This **splitting of duties** between old state structures and new institutions is not properly regulated today. As a consequence, actions are complicated and due to a lack of coordination, duplications and competitions of their activities arise. Since the various data is not stored as a standardised database it is not accessible for all stakeholders.

The existing **environmental legislation** cannot be considered a sufficient le-

Table 9.3: Overview of nature conservation and resource use within the TNP by different actor categories. The category 'tour operators' only includes hunting firms. The activities are arranged similar to table 8.1 and focus on the three focal areas of the TNP (based on interview data 2002).

Sphere	Residents	Administration	TNP auth.	Scientists	NGOs	Tour operat.	Tourists
Conservation	Mobility on pastures limited by means of transport	Missing management concepts for the use of resources	Missing management concept for the TNP	Missing data and scientific justification for nature conservation	Conservation only addressed in combination with economic development	Management of pastures inside hunting areas	Missing awareness of threatened status of Marco Polo sheep
	Awareness concerning overuse of pastures, <i>teresken</i> , Marco Polo sheep	Few staff, lack of law enforcement	Few staff, headquarters in Dushanbe	Participation in TNP demarcation and definition of zones	Combine wildlife protection with its use	Control of poaching	
Economic development and resource use	Resource use within the farming sector: pastures, agriculture	TNP and nature conservation have little priority	Missing demarcation and zoning of the TNP	Missing holistic approach to nature conservation, no inclusion of social sciences	Invest in sustainable use of resources, alternative sources of energy	Management of wildlife	
	Substitution of coal with local resources	Use of same resources as residents	No local staff, few staff, no local park offices		Eco-tourism projects	Well paid staff	Hunting of trophy sized rams
		Low salary leading to corruption	No tourism programme		Investments in local infrastructure	Well developed infrastructure	Low in numbers, little input to regional economy

Table 9.4: Table 9.3 (Continuation)

Sphere	Residents	Administration	TNP auth.	Scientists	NGOs	Tour operat.	Tourists
Economic development and resource use	Illegal hunting	Budget deficit	Budget deficit	Budget deficit	Support of local livelihoods: credit system, testing of new products and activities		
	Interest in knowledge in traditional use of resources	No internal education	Little internal education	Lack of documented data, inventories, access to data	Education and monitoring	Educate staff	Only backpackers show interest in cultural and ecological features
Research and education				Disciplinary research dominates			
	Low organisation as collective	Low cooperation with other institutions, unclear competences and responsibilities	Low cooperation with other institutions and residents	Low cooperation with other institutions	Act as intermediary between different actor categories	Well organised, certain cooperation with local actors	Hunters: organised in groups. Backpackers: individual travellers
Others	Little knowledge about TNP, no participation	Low participation in the TNP	Not a superior coordinator of the TNP	Important position within the TNP	No participation in the TNP	No participation in the TNP	No knowledge about TNP

gal basis for nature conservation since actual laws lack accompanying regulations. A combination of out-dated legislation from the Soviet period remains active although it contradicts a number of newly adopted laws. The effect of these conditions are exacerbated by the low salaries of state employees and local inspectors which make them susceptible for corruption and hinders the enforcement of the legislation. According to different sources of information, employees of Nature Protection Committees earn 3 to 6 US\$ per month, while an employee of a hunting company gets 100 US\$ per month. This misbalance creates tensions among local people and institutions.

The **management of natural resources by state-run institutions** may lead to unexpected reactions by the local population. Although the official number of hunting licences for Marco Polo sheep sold by the state to private companies is small, it provokes a certain illegal hunting activity by residents. Residents are aware that no incomes of the international hunting business flows back to their region and thus react with poaching. Thus the total number of animals killed by far exceeds the one assessed with licences. On the one hand, this interaction demands for an increased protection of Marco Polo sheep and a restriction of trophy hunting. On the other hand, the money coming in with trophy hunting constitutes one of the few sources to finance conservation measures. From this point of view, an expansion of trophy hunting may be desired. Aside from few people being active in the hunting business, no local people are living from tourism and thus the needed incentives to motivate residents for conservation issues are missing.

Until recently, questions related to the management of natural resources were decided by state farms or other state institutions. Today, **local people** cannot delegate environmental decisions to institutions anymore. Furthermore, they are not able to rely conservation management on traditional systems or knowledge since a lot of this got lost during the Soviet era. The management of resources as conducted under Soviet ruling had a negative impact on many spheres of the environment and thus this heritage cannot serve as appreciation of a sustainable use of resources. Hence 'sustainability' is understood in a very Soviet style and can hardly be differentiated from the concept of 'rational use' of resources.

Local people are aware that their knowledge in ecology has to be rebuilt and that some of their practices are harmful to the environment. However, due to the destitute condition of large parts of the population they only convert protective measures in relation with scarce resources needed for economic activities. Hayfields and winter pastures are among the most needed resources and are thus managed by farmer associations or state farms. The use of water in agriculture in the western part of the park is managed by persons selected by the community. Other resources such as *teresken* in the Eastern Pamirs are used without proper management or restrictions by the community.

The intensity of resource use, respectively their treatment, is further influenced by options of **access to resources** which are given by leasing contracts with the state, state institutions, farmer associations, means of transport, kin relations and traditions. While farmers in the western part of the park can get lifelong lease for agricultural plots, pastures in the whole area are not leased but allocated according to skin relations and traditions. Rich herders have a better choice of good pastures and mostly use the same summer pastures. Poor herders or herders with no relation to families who occupy a certain pasture since years are often changing their summer pastures with every year. As a consequence, only those farmers who lease an agricultural plot in the long term or use a certain pasture for years take care about the resources they use and try to act in a sustainable manner. Herders changing pastures every summer showed little attention to use them in a moderate manner to guarantee their quality. They explained to change the pastures as soon as the needed resources such as grassland, water and woody sub-shrubs are missing or are

in bad conditions. With their yurts they can easily move the location in summer.

The awareness of herders in the eastern part of the park concerning the appropriate treatment of winter pastures and hay fields is omnipresent. Herders apprehend their responsibility to enhance these **scarce resources**. Their respect for nature and society points out that this resource is not only considered as naturally vulnerable and limited, but as the key element of the economy that is strongly dependent on livestock breeding.

Comprising it is to note that even though most actor categories show a certain awareness concerning the need of conservation, the extent to which it leads to changes in behaviour is small. This fact is ascribed to the numerous influencing factors of conservation which are situated outside the ecological sphere (cf. chapter 4 and part IV).

9.3 Perceptions of the TNP by actor categories

In order that the TNP can contribute to the conservation of natural resources and biodiversity, it is dependent on the support of all actor categories. This in turn is affected by the perception of the TNP. Perceptions result from the basic knowledge the actors have about the park and its valuation by the different actor categories. Therefore the differences and similarities concerning the knowledge about the TNP and the resulting perceptions of and attitudes toward the TNP as seen by different actor categories are characterised below.

The focus on the perceptions does include all identified actor categories, no matter if they are actively working on the TNP or if they are affected by its establishment.

Again it is to mention that statements of the actor categories 'international organisations', 'tour operators' and 'tourists' only base on few interviews and thus may not be fully representative for the whole actor category.

9.3.1 Local resource users

The bigger part of local people is not informed about the TNP at all. They do not know that the park is on the way to be implemented, nor do they know anything about its aims. Some of the people living inside the TNP even have no idea what is a national park. Few residents never heard from the TNP before, but know something about nature sanctuaries existing in the region, even they cannot locate them exactly.

Locals who state that they know about the TNP refer to various sources of information. One herder reported that he knows about the project because he is related with a person working in the park authority. Several people living inside the TNP explained that they were informed about the TNP once or twice during the last 10 years by foreign people or researchers visiting the area. Since this source of information mostly dates back several years, the knowledge of the residents concerning the TNP is rather vague. Local people often mentioned that 'they' want to establish a protected area somewhere in the Pamirs. 'They' may not be assigned to a specific institution but refers to actors coming from outside the Pamirs, as an employee of a NGO explained.

This lack of knowledge seems to have different reasons. First of all, hardly nothing in the field points out the spatial limits of the TNP or other protected areas. The only signboard that could be found is located in the surrounding of Muzkol sanctuary. It was in a bad condition and installed along the dirt road coming from Murgab - but herders living in this area mostly come from the Bartang side, so they do not pass this signboard. Secondly, resident land users are not informed about the TNP and other protected areas by the appropriate authorities. Due to the

remoteness of the area the staff of Nature Protection Committee hardly ever visits the area. If they can organise the gasoline to drive there their task is to control illegal activities, not to clear up residents about protected areas and special rules. Farmer associations and other local institutions are hardly informed about the TNP neither and may not hand on any detailed information to the herders. Thirdly, the lack of knowledge concerning the TNP may also be pretended by some residents. On the one hand, people are stamped with negative experiences in relation with the breakdown of the Soviet Union that caused rapid changes affecting all spheres of livelihood. From this it follows that local people may be sceptic towards changes since they are always ruled from outside their scope. On the other hand, people are used to the remoteness of the area that does not only cause isolation from society but also liberty in terms of abiding the law. Therefore, local people may not like to get new rules dictated from Dushanbe and try to ignore them, especially when they negatively affect their scope.

Since local people are not well informed about the TNP they show little interest in this project. The first reaction of many local people was often focusing on possible new rules that may constrict their scope. One herder stated that there have never been any kind of explanations from the national park authority concerning the impact of the TNP on the local level but the government just impose new rules in relation with the park without consultation with local authorities.

It was blazing how many people stated that the TNP is of no value for them since they get no profit of it. Since the existing protected areas never provided any positive input to their live, they do not develop positive notions toward new protected areas called 'national park'. Positive inputs would be the creation of new jobs. But most of the jobs that were created during the last 10 years were appointed to people coming from outside the area, thus residents don't expect any change in their economic situation. Only a herder who is related with a person from the park authority - and is thus the resident that is informed best about the park - stated that the establishment of the park is a good idea since it will attract tourists and thus he can find work as a hunting guide or lease his donkey to trekkers.

Most residents put the TNP on a par with other protected areas they already know. According to their notion the TNP does not differ from other protected areas apart from its size. This leads to a perception of the TNP as an area being only selected for the conservation of flora and fauna, which is sometimes stated to be 'good and important'.

Hunters often focused on wildlife when talking about the TNP. Their perception of the TNP is ambivalent. On one hand, they consider the TNP to be good for the conservation of wildlife species such as the Marco Polo sheep from poaching by the military and others. On the other hand, they fear that the TNP could also hinder their illegal activities and thus limit their scope. Consequently, as long as the TNP focuses on the conservation of wildlife that does not only prevent other actor categories from poaching but also hinders their own activities without offering alternative options for income generation, their attitudes towards the TNP is rather negative.

9.3.2 Local and regional administration

The local authorities were little informed about the TNP and always referred to the regional departments or the authority of the TNP for more information. The TNP is assessed as not yet functioning because the authorities (meaning the ones on the national level) are still deciding about it.

Employees of local authorities showed a passive attitude towards the TNP which pointed out that they estimate their sphere of influence little. They seemed to understand their job only as executive, but not as formative or participative. Their

comment about the TNP based on what they once heard from other authorities and hardly ever included their own perceptions and ideas. Therefore the statements of local authorities concerning the TNP all looked alike.

Local as well as regional authorities often mentioned that the TNP focuses on many different matters such as conservation, improvement of the quality of resources, intensified studies, and analysis of lakes and rivers as base for industrial development. This indicates that due to their limited base of information and the difficult economic situation especially local authorities associate all kind of expectations onto the establishment of the TNP.

According to the information from an employee of a NGO, not all regional authorities are looking forward to the establishment of the TNP. They regard this project as a competitor about natural resources and competences. Some regional authorities are said to have other plans within the area of the TNP and are not willing to share their sphere of influence with another institution. Especially in the eastern part the regional authority wants to increase the numbers of livestock which is seen as only chance to improve the economy in this region. Therefore they would need all available pastures in their *rayon* and don't like to assign the remote ones to the TNP.

9.3.3 TNP authority

The interviewees of this actor category often referred to the ongoing planning process of the TNP. Due to the fact that everything was under construction only little detailed or final information could be given. As a result to the long time span within interviews were conducted, the information often changed due to its topicality.

The members of this actor category are looking forward to the establishment of the TNP because they expect great positive impacts on nature conservation issues and on economic development and cooperation. They mentioned that the TNP forms something like a subordinated frame for all kind of activities that should take place in its sphere and follow the targets of the park. This comment points out that even though the main goals of the TNP are defined, the sphere of influence of the TNP is not really specified or arranged yet. Statements of the park authority about nature conservation activities often mixed with planned tourism projects, economic improvements and research projects. This shows that the TNP spreads out on many application areas and thus becomes a diffuse construct not only for some partially included actor categories, but also for the members of the park authority.

Only one interviewed member of the park authority seemed to be fully aware that the implementation of the park is at its very beginning. He explained that not all people involved in or concerned by the planning process of the TNP are well informed about the activities that are going on and thus it is too early as especially local people could know something about the TNP.

9.3.4 Scientists

With respect to the Soviet organisation of protected areas it is comprehensible that the Academy of Science regard the TNP as an expansion of their field laboratory and sponsor for new research projects in natural sciences. A botanist working at the University of Khorog stated that the TNP authority does not sufficiently focus on botanical matters because there is a lack of botanical specialists. That's why the TNP focuses more on the fauna than on the flora, which is in his opinion not right. This statement points out that scientists are not willing to share this field lab with other fields of study and only focus on their own project with little interest in interdisciplinary research. According to statements of this actor category, social scientists are not addressed with the TNP.

Foreign researchers do not consider the TNP as a close entity, but as a space that interacts with its surrounding on different scales and matters. According to statements of members of this actor sub-category, the TNP is assessed as an administrative unit that allows research in combination with development on various fields of interest, such as management of natural resources, biodiversity conservation, public education, regional development and increased international cooperation. Many of these foreign scientists assess it as a challenge to apply their ideas of biodiversity conservation in a mountain area of a former Soviet state that was not accessible for a long time.

9.3.5 International organisations

Members of this actor category assess the TNP as a constitution that may - if some basics are taken into consideration - attract tourists and foreign investors and thus can create new jobs and enhance nature conservation activities. However, since until today no activities are implemented in the field, the TNP is not really noticed.

International organisations who are not directly involved in nature conservation matters put the TNP into a larger context. In their perception the TNP is not yet established and until today has no influence on the region, special areas or on their own projects. All the same the TNP is regarded as an important future project with the goal to protect the flora and fauna, especially the Marco Polo sheep, and to assist development of the whole region.

9.3.6 Hunting companies and tour operators

The hunting company that is running its business within the park boundaries seemed to take little notice of the TNP and the possible consequences for their business. Other hunting companies as well as tour operators perceived the TNP as a chance to promote tourism in a more general manner that does not only focus on Marco Polo sheep trophies. As an employee of a hunting company stated, the area of the TNP provides great potential for the promotion of eco-tourism, including mountaineering and wildlife safaris. However, these options of the park are assessed as hypothetical since at the moment the TNP is said to ignore the official national regulations and international standards and thus is not existing.

Most members of this actor category did not assess the TNP as an instrument to strengthen nature conservation. Particularly members of hunting companies explained that, at least at the moment, the best and only way to conserve natural resources (wildlife) is by running the hunting business with well educated and well paid staff within certain areas.

9.3.7 Tourists

The motive of travellers to visit the area is based on the legends and the natural beauty they relate with the term 'Pamirs' and not with the term 'Tajik National Park'. In fact no tourist knew about this park and the interest they showed toward it was very little. All they wanted to see they could visit also outside the park, thus they showed no intension to visit areas inside the TNP which are difficult to reach.

As backpackers, hunters did not know anything about the TNP. Even though some of these hunters shot their trophy within the TNP, no one of them was aware of the location of protected areas. When talking about protected areas, they associate the TNP with the national parks they know from their homeland. This leads to the perception of the TNP as an instrument to protect the (trophy) animals and promote tourism which is assessed as positive and important.

One hunter was convinced that most of the immense sum he spent for this hunting trip goes to the local hunting company and is invested in the protection of wildlife.

Several hunters knew the studies of the US Fish and Wildlife Service and the WWF concerning the state of wildlife of the Pamirs. With respect to these studies, trophy hunting was always mentioned to be not harmful and be compatible with protected areas, even though some of the hunted species are listed in the Red Data Book of Tajikistan.

Concluding remarks

The perceptions of the different actor categories concerning the actual state of the TNP all look alike when focusing on its establishment. All actor categories stated that at the moment the TNP is not yet fully established. When focusing on the implementation process or on its future impact on the region, the statements of the different actor categories, however, are not congruent.

Local resource users do not associate the same with the TNP as other actor categories. Even though their interest in improved access to the area, conservation of natural resources, such as wood and wildlife, and in the creation of new jobs may all be covered within the TNP, most local resource users do not expect great positive impact of a national park that will probably be established once in the future. Moreover, they formulate fears concerning possible restrictions of their scope. This may be explained by their experience with already established protected areas (e.g. Muzkol sanctuary) which never brought any positive input for them. Furthermore, local people are well aware that money derived from local resources by 'others' disappears to regions and people outside the area, particularly to Dushanbe. Residents don't believe the authorities that this money is re-invested in the mountain region since they never see any result. Generally, the perceptions of local people are strongly influenced by the Soviet concepts of nature conservation. Thus they cannot arrange nature conservation with the use of natural resources but correlate the TNP with the protection of single species included in the Red Data Book.

Statements from illegal hunters and other local resource users about their activities and about the activities taking place along the smuggler routes leading through this area give rise to the assumption that due to its location along the borders of different *rayony* and the hardly reachable remote valleys, the area inside the TNP is widely understood as a lawless zone. From this it follows that local resource users associate the establishment of the TNP with the empowerment of new laws and fear that their scope will become restricted.

Unlike local resource users, authorities from the local to the national level as well as **scientists** consider the TNP with great expectations. These, however, do not always focus on the TNP as an instrument for regional development or investigations in biodiversity conservation, but on the option to improve their own financial and personal situation within the framework of the TNP. This perception is furthered by the statements of various interviewees pointing out that their institution does not feel responsible for the implementation of the park since it only takes in a passive part.

This passiveness of different **administrations** but also the huge number of institutions involved in the TNP cause that the engagement of international organisations is rather sceptic. The TNP is seen as a theoretical construct whose implementation strongly depend on various factors which are situated outside the sphere of nature conservation.

The perceptions of **tourists** and **international organisations** point out that protected areas called national park stimulate associations with the concept of national parks known in the West. Many interviewees focused on a certain image of a national park in the Pamirs which does not take into consideration the Soviet history of this area.

9.4 Discrepancies between the interests of actor categories

Today, resource use and conservation is hardly coordinated among the different institutions authorized with the management of natural resources (cf. subsection 9.2). Discrepancies between the official management practices and their implementation or between statutory provisions and practices of local people are well present. The disagreements hamper discussions focusing on future activities in conservation. The causes for these discrepancies may not only be found within the ecological sphere, but extend to the socio-economic and the political sphere. The following section highlights some of the most apparent discrepancies related to the use and management of natural resources within the TNP.

9.4.1 Conflicts between the TNP and resident people

Due to the fact that the existence of the TNP does not limit local resource users in their activities at the moment and people are hardly informed about the existence of the TNP, there is no opposition from resource users directly against the TNP. Only one herder living inside the TNP stated that tensions between the park authority and local people exist. He ascribed this to the nature of communication between the TNP authority and the resident people and explained that the only way of communication is regulated via the legislation of new rules from Dushanbe. He deplored that local people cannot participate in any decision and only become dictated some rules. Furthermore he explained that the herders would not accept a regulation of livestock numbers or the access to summer pastures by the TNP authority since this is up to other departments to decide, like the Land Use Department, farmer association and *gozkhoz*.

Tensions between the park authority and actor categories on the local level are present concerning the definition of the TNP boundaries in the field. As a foreign researcher explained, the *rayony* were affirmed by the TNP authority that the TNP causes no change in land use, thus they agreed to the establishment of the park. The delicate task to clarify the exact boundary in the field was then delegated to the Land Use Department of the *oblasty*. Although the zones of the TNP are not defined or located it is now clear for all actor categories that there will be some changes in land use in several areas. Thus the negotiations about the park boundaries turned out to be very difficult, causing tensions on both sides. These incidents show that a frank communication between the TNP authority and the actor categories concerned by the park are essential for any further proceedings.

9.4.2 Discrepancies concerning the actual management of resources

Actual conflicts and discrepancies do hardly focus on the TNP itself but concern the use of natural resources inside and outside the park area. Conflicts may focus on elements of landscape ecosystems, such as wildlife and vegetation, or they may focus on entire landscape ecosystems, such as the TNP or a hunting area. These conflicts are not always distinct but often apparent latently, however, all of them may be regarded as reasons for the difference between the actual and the target state of the TNP.

The most obvious conflict related to natural resources concerns wildlife, in particular Marco Polo sheep, and includes almost all characterised actor categories. Conflicts between different actors and actor categories related to the *arkhar* are often caused by cultural misunderstandings and ignorance, as an employee of an international NGO explained. Only one herder, an older Kyrgyz man, included all people when criticising illegal hunters and did not differ according to their cultural

background. He deplored not only about illegal hunters from abroad, but also about resident people who shoot Marco Polo sheep for business purposes. He blamed these poachers to be only interested in today's profit and not to care about the future. Most people however blamed 'the others', meaning people belonging to another culture, for the decline of Marco Polo sheep. This became obvious when visiting the area of the TNP that is used by different cultural groups. Kyrgyz people from the eastern part burden the Pamiri people from the western valleys and Khorog as well as the Russian border forces with the reproach of extensive poaching and taking profit by selling the meat on the bazaar. In return, Pamiri people from the Bartang valley are doing the same when accusing the 'wild Kyrgyz people' from Murgab side to poach a lot for covering their demand for meat which is stated to be immense.

The conflict related to wildlife is not only present between local groups, but also focuses on the existing law and its advocacy. A man from Muzkol area explained that the decline of Marco Polo sheep is not stopped because the numerous staff of the Nature Protection Committees are not working proper. He stated that even though there are special rangers in every village to control illegal activities, control is not conducted. This is seen as delicate not because it causes a continued decline of the Marco Polo sheep populations, but because the rangers get a salary from the state budget. This may provoke an increase of illegal activities by local people, since on one hand they know that they are not controlled and on the other hand they want to compensate for not getting a salary themselves. Control of illegal activities has to be very strict to be effective. Statements of poachers pointed out that they are not afraid of punishment since many of them are related with a person working in an institution related to nature conservation so they will not be punished. This was not always that way, as a statement of a former poacher clarified. He reported that during the Soviet era controls of poaching were very strict and he had to go to prison for several years when he was caught. According to his information, these conditions led to a low poaching activity until the outbreak of the civil war. Today many local people are in conflict with the law but don't care about it, because they regard it as some kind of unwritten law that they, as the historic inhabitants of this area, have the right to hunt what and when they want. A local hunter emphasized this evaluation when he explained that the rules concerning nature conservation are the same everywhere, no matter if there is a protected area or not, but poachers don't care about them and hunt every time and everywhere.

Conflicts related to resource management are strongly dependent on the perceptions of the different actor categories. Local people mentioned that in fact they are the ones that effectively protect ungulates from wolves and thus have to be allowed to hunt them sometimes. Local hunters stated that 'the others', meaning the military staff, the Russians, the local and regional authorities, the foreign trophy-hunters and other groups that are not dependent on an additional source of meat, are poaching and thus are responsible for the decline of wildlife species. Many participants at the Seminar on Sustainable Management of Nature Resources and Wildlife stated that illegal hunting by herders is not a big threat compared with the poaching done by military staff because the latter hunt not only for subsistence but also for pastime. They explained that officials from different administrative levels do not really hunt themselves, but lend their rifle and ammunition to others, ordering the meat of Marco Polo sheep as rental fee. Officials themselves blamed the army and the people living on *jailoos* to be responsible for the decline of the *archar*.

The most important factor to which the amount of poaching corresponds to is influenced by an external actor group. Members of the actor categories 'NGOs' and 'scientists' assessed the trophy hunting by tourists as critical factor, even though the degree of trophy hunting is little and does hardly harm the whole population. Trophy hunters themselves were not aware of their impact. They stated that after their impression there are still plenty of Marco Polo sheep left since they only take

few of them. Furthermore, local people may profit from their activities by means of the provision of meat and generating income. However, the reality looks different. Marco Polo sheep hold an important role in the Kyrgyz epos *Manas*³² and thus can be regarded not only as a natural, but also as a cultural object towards which people feel strong emotions. An employee of an NGO explained that it is hard for local people to see that while hunting for them is forbidden, foreigners may come to their area and take the best rams away. Furthermore, the fees the tourists have to pay for the trophy all runs to the centres outside the mountain area. As a consequence, local people react with poaching. They refer to their historic right³³ and thus take what they need without asking for permission.

This attitude is not only present concerning wildlife but may be generally described as the 'inside-outside' syndrome³⁴: Local people assume that 'outsiders' take out resources of the Pamirs without asking for permission and without returning any compensation to 'insiders'. For example the revenues of the hunting business or the dealing with precious stones are never coming back to improve living standards of local people. These experiences cause a sceptic attitude of residents towards people who enter their space without laying open their motive. As a reaction, local communities who are aware of the value of a resource but are not able to take profit out of it on their own try to prevent these resources and all information related to them from 'outsiders'. Local people in the upper Bartang for example were convinced that foreign people visiting their area are either looking for trophies or for precious stones. Since they have no means to explore the appearance of precious stones or to mine them they fear that these 'outsiders' may explore this resource without sharing the profit with them. This in turn provokes that 'outsiders' are not motivated to cooperate their activities with the 'insiders', as an employee of a NGO explained. Foreign as well as local employees of NGOs stated that this problem may be a legacy of the Soviet past and the civil war which hamper the impartial communication among all administrative levels. People are said not to be used to deal together and until today have problems to communicate with each other without provoking misunderstandings, revisions and repressions.

Discrepancies are not only present between actors who directly use natural resources, but also among the institutions who rule its use. Tensions are well present between the different departments and institutions that are dependent on the state budget. As an employee of an international NGO explained, they all compete for funds and power. However, since none of them can handle and coordinate the whole project of the TNP alone, no one wants to be responsible for it.

Concluding remarks

Conflicts arise from different interests in the use and protection of resources and are present on various levels.

Local people are not given the same **rights concerning the use of resources** as other actor categories. The law is not enforced with the same degree and credibility on all levels. Local people for example are not allowed to shoot Marco Polo sheep and can not organise a hunting licence for these animals. Hunting licences for Marco Polo sheep are only sold to foreign tourists. While local people are told that this species is threatened and thus not available for them, the state takes out profit of

³²Manas, the epic of the Kyrgyz people, tells the live of the Kyrgyz hero Manas, who was a fighter for liberty and independence more than 1,000 years ago. It contains more than one million verses and thus constitutes the longest epic known in the world.

³³Already at the end of the 19th century the French scientist M. G. Capus wrote that Kyrgyz people from the Pamirs are only seldom slaughtering livestock but use Marco Polo sheep and ibex as a source of meat (Capus, 1890).

³⁴The term 'outsiders' include not only foreign people like trophy tourists, but all people that are not home to the Pamirs.

these animals by the participation in the trophy business. Furthermore, employees of the administration and several powerful people are not fined when they override the regulations. As a result of this unequal right concerning the use of resources and the fact that hardly any local people may profit from the trophy hunting business, local people react with illegal hunting and thus provoke the administration. Consequently, the legal system provides the incentives for local resource users to use the wildlife resources in an unsustainable way - or in other words, provides the disincentives for conservation.

People are very sceptic opposite members of other cultures. Various accusations point out that people living side by side in a similar environment have many prejudices that complicate an integration of different cultures to create a common identity of all people living in the Tajik Pamirs. This latent problem in the Pamirs may be aggravated by the intervention of new actor categories from Dushanbe and the lowlands. **Ethnic tensions** are not only present between single actors, but also among departments. The competition between them lead to an ineffective organisation of the resource use within the administration.

The society is **organised strictly hierarchical** . Thus people clearly assign competences and tasks to the various departments. Some interviewees showed little will to revise their appreciation about these departments and thus they would not accept any rules dictated from a department which is not assigned with the needed competences. This handling leads to the question if the TNP authority - as a newly established administrative body - will be accepted as such by resident people as well as by other institutions. However, due to a lack of confidence in state institutions, local people disregard the legislation and meet their demands on their own. Generally, residents show little interest to cooperate their action with state institutions.

Part IV

Synthesis and Conclusion

Chapter 10

Claim and reality of conservation within the Tajik National Park

As part III clearly points out, the target state of the TNP as proposed by the TNP authority or by the different actor categories does not match with its actual state. This chapter analyses the empirical data of part III and highlights the differences and consensus between the target and the actual state of the TNP with respect to nature conservation. Possible reasons for the differences and possible consequences for the further implementation of the TNP are assessed from the point of view of the author. As outlined in figure 10.1, this appraisal gives inputs for a revision of the objectives of the TNP with all stakeholders to mitigate conflicts and serves as a basis to assess requirements for the further proceeding of the park.

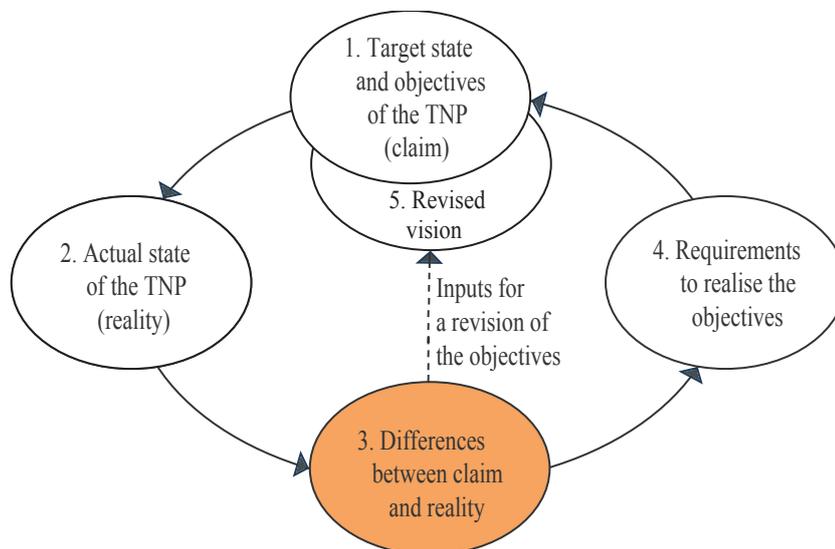


Figure 10.1: Step 3 - Appraisal of the differences between the target state and the actual state (own illustration).

Section 10.1 focuses on the general framework of the TNP. The second section compares the objectives of the TNP as assessed by different stakeholders. Section 10.3 analyses the differences between the claim and reality with respect to the organisation of the TNP. The last section finally compares the variety of ways natural resources within the TNP are managed.

10.1 The framework of the TNP

10.1.1 The connection of the TNP with the lowland

The policy concerning the TNP is influenced by the relationship between the Pamir Mountains and the lowlands. The GBAO has since ancient time an autonomous status which gave the inhabitants a certain feeling of independence. At the same time the remote mountain area is strongly dependent on the support from the lowlands in form of infrastructure and food. As a consequence of this relationship, huge regional projects, such as the establishment of the TNP, assessed by actor categories from outside the Pamirs may provoke a hostile attitude of mountain inhabitants since they feel patronised by the lowlands.

10.1.2 Appreciation of conservation and the TNP

As a consequence of Tajikistan's Soviet past, the appreciation of conservation is similar among all Tajik actor categories. Under Soviet ruling, people learned that nature conservation is to be separated from human activities and until today many people from different levels are still adhering this principle. Therefore it is important to clarify public understanding of nature conservation and to demonstrate especially to local people that nature conservation activities may well pay attention to the human interests and that both conservation and use may be balanced within a sustainable approach.

The separation of strict conservation and resource use may also be found within other actor categories, including the national scientists, administration and the TNP authority. As a consequence, the official objectives of the TNP split these elements of the land use system according to the different goals of conservation and economic development. Thereby conservation only includes requirements focusing on strict protection.

The actual as well as the future conservation of resources strongly focuses on the maintenance of biodiversity. The RDB is assessed as most important indicator of biodiversity, while cultured species and cultural habitats are not taken into consideration.

The perception of the TNP by local resource users is strongly influenced by their actual livelihood and experience. They hardly discuss long-term visions but formulate short term economic expectations and fears concerning possible restrictions of their scope. The value and benefits of biological diversity and its conservation are not well understood on the local level. Benefits of conservation of biodiversity and certain resources is not perceived to be sufficiently real or immediate and thus may not awake public opinion. Since this is also a problem at other levels as well as within the government, little action is undertaken to inform society about biodiversity conservation and new forms of protected areas. As a consequence, local people assess the TNP as being similar to the other existing protected areas, which restrict the use of resources and constitute strange islands not accessible to the local population. However, local people are aware that new regulations passed in Dushanbe are of low value in the remote areas of the Pamirs and will rarely be strictly enforced by the local administration.

The NGOs assess the TNP as an instrument to foster regional development. In doing so they expect improvements in cooperation, empowerment, economy and conservation. Furthermore the TNP may serve as an exercise field to apply participatory approaches. This assessment of the TNP is similar to the expectations of the TNP authority, even though the latter rates the priorities differently (see below).

10.1.3 Acceptance of the TNP

The future acceptance of the TNP will be strongly influenced by the numerous perceptions of the different actor categories. In general, all actor categories agree that the value of nature should be obtained. Ideas about how this should be realised, however, diverge. All actor categories mentioned various expectations concerning economic advantages and disadvantages. Only when these advantages are met, will the TNP gain the support of that particular actor category. In addition, irrational attitudes may additionally influence the acceptance of the TNP. These attitudes focus on traditions, positions and rights. Local resource users for example often stated their traditional right to use a certain resource, particularly pastures. They showed a certain sensibility concerning nature and its elements, even though their actions and the identification of possible causes stand in conflict with this. However, the presence of this sensibility is crucial for the future acceptance of the TNP by local actor categories. Other irrational attitudes focus on nature conservation in a general manner. As outlined above, these are mainly carried over from the Soviet past.

10.2 Objectives and priorities of the TNP

The objectives of the TNP as assessed by the park authority focus on numerous aspects which when combined should contribute to an improvement in the regional development of the Pamirs. However, as the present situation points out, the definition of the goals lacks sound scientific data and clear administrative structures which are needed for decision-making. As a result, the objectives of the TNP are not based on the actual situation within the park but instead describe the ideas of a few actor categories that pay little attention to the actual situation and the objectives as seen by the local stakeholders. Since the goals of the TNP are inconsequently defined, it is not at all clear whether the park should primarily focus on nature conservation or economic development. The subdivision of these aspects into different goals points out that the concept of integrated sustainable development is still not understood the same way as in the West. However, some employees of the regional and local institutions explained that the main focus of the TNP cannot be directed to strict nature conservation alone when it has to get the support of the local population. Members of the strategic sector 'biodiversity' at the Workshop for Sustainable Development of the Tajik Pamir in October 2002 stated that the main threat for biodiversity is the lack of energy. They were aware that elements from all spheres interact with each other and the handling of one may have effects on the others. Especially the treatment of the needs in energy and fuel were mentioned to have great effects on the future state of natural resources, e.g. wood and *teresken*. Therefore, the success of the TNP is primarily influenced by the promotion of regional development and not by activities related to nature conservation alone.

All actors, from the local to the state level, assess the improvement of their livelihood or the improvement of the financial situation of their institution as a primary objective of the TNP. The goal to improve the state of the natural resources and the environment is subordinate to economic improvement.

Tourism is assessed as main economic activity of the TNP. Particularly actor categories from the regional level expect the park to positively contribute to the development of tourism. This indicates that not the economic activities of the resident people within the park are the objectives (support with hay and fertilizer to increase the yield, promotion of the production of new goods and the access to markets), but that the TNP itself is assessed as a label for tourism from which the resident people are expected to make a profit (foreign tourists come to visit the TNP). Considering the actual situation of the resident people in the park, it

is questionable whether the promotion of tourism will enhance their livelihood or if tourism will only increase the pressure on already scarce resources in the future (*teresken* and Marco Polo sheep). The NGOs and local resource users rate the option of the TNP to improve the tourism business much less. They do not assess tourism as a single economic activity that can solve all economic troubles of the mountain area but as an option to diversify local strategies of income generation.

10.3 Organisational aspects of the TNP

10.3.1 Funding

Funding of the TNP is not adequate and thus important tasks of the park cannot be implemented today. Future funding is strongly reliant on the support of external actors, such as international organisations and tourists. The actual situation points out that the tourism business is not established in the Pamirs to such an extent as to be able to help funding the TNP. Furthermore, experience in mountain regions in Kyrgyzstan and Pakistan shows that the political tensions in Central Asia can strongly impact tourism. Even though today's income from the hunting business should already contribute to nature conservation, the transfer of money to the centre and its reinvestment in the mountain region does not occur. The splitting of this income among the different state institutions and the TNP is not regulated and would be difficult to organise.

10.3.2 Responsibilities and participation

Today the organisational structures of the TNP are split among numerous state institutions and are not coordinated by the TNP authority. All competences are situated at the state level, while actor categories from a local level are not included in the organisational structure. Most members of the administration assess their function within the TNP as passive in terms of responsibility but raise the claim to be included in the sharing of benefits derived from this project. Recrimination for the limping implementation process is common between authorities of the same administrative level as well as between institutions active on different levels. This situation means that none of the departments involved in the planning process of the TNP accepts any level of responsibility. Few members of the administration mentioned the improvement of cooperation and communication between the departments as a objective of the TNP. Only the TNP authority itself expects the establishment of the TNP to contribute to a reorganisation of the numerous institutions and to an improvement of the cooperation between them. With respect to the actual understanding and behaviour of the administration and the vague outline of organisational priorities, this objective has to be assessed as too optimistic. It will be difficult to brake up the actual structures of power since the single institutions consist of branches of the state, the regional and the local level and thus can easily assert their interests.

The planning process of the TNP, including the assessment of future zones and their management, is strongly influenced by the scientific community, particularly by the Academy of Science. This legacy of the Soviet Union has to be reviewed, especially with respect to the fact that actually the contribution of this institution to relevant questions in terms of making available basic data needed for adequate management is little.

As a heritage of the Soviet system, local resource users are hardly organised as a collective to enforce specific common interests. Local resource users assess their role concerning the TNP as very passive and do not expect to be included in the decision-making concerning the TNP or into the sharing of benefits. This fact shows a deep

mistrust in state institutions. However, while many local people refuse to follow the regulations of protected areas which reduce their scope, they nevertheless demand that the state support them with fuel and hay as done during the Soviet period. Thus without any assistance from the state level it is not possible to appoint local resource users as administrators of the park, delegate the responsibilities for the TNP to actors on the local and regional level and establish a community-based conservation as proposed by the TNP authority. Participation of local actor categories presumes not only investment in communication and exchange of information between the different levels, but also training of local actors to emancipate and act as an interest group with common interests. Ideas about how to strengthen local communities and to include them, not only in the planning process of the TNP but also in the continued management of natural resources and in the sharing of economic benefits, are undefined even in the target state. The actual handling of local resource users and the priorities they mention with respect to the TNP point out that their willingness to take responsibility for the resources they use is small all the while they are unable to profit from these resources. Facing these challenges it remains unclear how the TNP authority plans to establish itself as the superior coordinator of the TNP and to delegate the management to the local level.

Due to their weak experience in conservation of natural resources and biodiversity and in the implementation of a protected area according to international standards, the park authority awaits foreign support and investment. Some members of the TNP authority even mentioned the insufficient financial support from foreign organisations as being the main reason for the lagging implementation process of the TNP. However, the involvement of international and foreign actor categories in the development of the TNP is not further specified in the target state. International organisations and foreign scientists occupy a rather passive role. They expect to contribute to the TNP as a back stopper but are not willing to assume an active part in the planning process, since this project has to be managed by Tajik actor categories.

10.3.3 Legal regulation

Legal tools related to nature conservation and the handling of natural resources are manifold and thus the TNP authority does not focus on the passing of additional laws. However, nowadays the coexistence of former Soviet decrees with newly enacted regulations cause a complex legal situation that is neither clear for the administration nor for the public. The authority misjudges the need to reorganise and restructure the existing laws and today's legal shortcomings are not addressed by the TNP.

State regulations and the handling of them by the administration hardly include the interests of local resource users. The regulation concerning the hunting of wild ungulates for example points out that while resident people are not able to buy a hunting licence and have to fear being fined as poachers, members of the administration, hunting companies and the army are able to do the same without worrying about the consequences. Since it is not clear if new legal regulations will be enacted for the TNP or if the TNP itself may contribute to a revision of the existing laws, it remains uncertain if in the future legal regulations will be valid for all actor categories.

To this day inhabitants of remote areas within the park do not pay attention to the state regulations and regard their environment as a lawless zone. As a consequence of the low salaries of state employees, bribery occurs and contempt is rarely fined. However, the state agencies need more than just the ability to levy fines. They need a means of enforcing conservation other than by fining poachers and other illegal activities since fines do not halt the degradation of resources. This asks

for an environmental philosophy in the policy, regional planning among the different administrative levels and cooperative environmental contacts. These needs are not sufficiently met today or addressed by the target state.

10.3.4 Staff

The main part of today's staff of the TNP works in the headquarters located in Dushanbe. They are not only spatially, but also mentally far away from the area of the TNP and its inhabitants. The employment of new staff is urgent, but this can only be successful when ethnic conditions are respected and all stakeholders are offered options for employment. Experience in management of protected areas is missing on almost all administrative levels and thus huge investment in education and practical training is needed to guarantee that the staff are able to meet its tasks. The actual situation points out that adequate salaries are essential to stop bribery and to motivate the staff to fulfil their duties.

10.4 Management of resources within the TNP

10.4.1 Management category

The missing allocation of the TNP to an international concept of protected areas highlights that the park authority is not sufficiently aware that the international community as potential donor may only be attracted with the presentation of a detailed concept of the TNP that meets international standards of conservation and resource management. Particularly the concept of biosphere reserves presents a good option to include all objectives of the park, but this is only mentioned by NGOs and foreign scientists (cf. chapter 11). The park authority only focuses on the category of a national park even though not all aims of the TNP are compatible with the category II of the IUCN classification scheme of protected areas (e.g. trophy hunting).

10.4.2 Selection of the area

The TNP encloses an area of about 25,918 km^2 in the heart of the Tajik Pamirs. The demarcation of the TNP is explained as being geared to the goals of the TNP and thus should include relevant areas of biodiversity, habitats of threatened species and areas in need for intensified protection. The huge area of the park may be a necessity to ensure the conservation of various species and of mountain biodiversity. However, the extent of the area alone does not guarantee the quality of conservation.

Significant biodiversity is present in forests, hay fields and dense marsh vegetation along lakes and rivers as well as in and around inhabited areas which include wild relatives of cultivated species. These areas are intensely used and subject to increasing degradation because of human population pressures. Degradation of natural resources has an adverse effect on the conservation of biodiversity within the TNP and endangers species and soils in two distinct ways: land degradation directly affects the TNP which often results in direct encroachment and reduction of productivity, particularly on overused pastures where *teresken* is gathered. In addition, land degradation leads to reduced return for local resource users, so causing a further demand on resources of other non-degraded lands, including the TNP.

As the analysis of the landscape ecosystems, the actual use of resources and its impact on the environment point out, the relevant areas of biodiversity and the areas most threatened by degradation, such as winter pastures and forests, are not contained within the park border of 2003. Mainly included are grassland, glaciers and barren land; cultivated and forest land of the Western Pamirs are mostly excluded from the TNP and thus the area is not favourable in realising the goals of

a TNP focusing on conservation of rare and endangered species. This leads to the assumption that the TNP was created according to considerations of feasibility and simplicity to limit human impact to a minimum and that particular attention has been paid to how areas of the park may be used for the purpose of tourism. It seems that little attention was paid to the actual pressure on certain resources and the fact that with a continuously growing population along the park borders, the pressure on resources inside the park may further increase.

Since the goals of the TNP are not precisely defined, sound criteria for the selection of an appropriate area are missing. However, the formulation of goals and their communication to all stakeholders has to be the number one priority of the park project. Only then can the appropriate area needed to realise these goals be selected. This order should not be changed. It makes little sense to select a certain area and then to search for valuable goals for this area.

10.4.3 Zoning

The concrete definition of specific zones and their spatial assignment depend on the management category of the TNP which is not clearly defined in the target state.

The decision about the zoning and particularly about the areas that are to be further used as pastures inside the park seems to be very delicate. On the one hand, the limitation of livestock and thus the human impact on certain areas is necessary to guarantee some undisturbed habitats for wildlife. On the other hand, experiences of botanists and herders show that the number of plant species is positively influenced by moderate grazing. The goal to prevent remote pastures from grazing may thus cause a decline in plant diversity in these areas. Furthermore, the exclusion of certain areas from use as pastures may cause increasing pressure on other pastures located inside and outside the park. New regulations may greatly restrict traditional rights of land use by local people who rely heavily on natural resources as a primary or supplementary means of subsistence. When giving little in return, these regulations may force local people to find alternative means of livelihood. The park authority seems to be aware of these important dependencies and thus the aimed use of pastures is not yet further specified.

Similarly to the future use of the pastures, the target state concerning the future of hunting companies located inside and along the TNP is not clear. On the one hand, trophy hunting is assessed as an important part of the economy and with respect to the promotion of tourism and future funding of the park is likely to be accepted in certain zones. On the other hand, trophy hunting is not compatible with international regulations of protected areas, particularly not with the category II of the IUCN system of protected areas. The park authority never mentioned the delicate connection between trophy hunting and poaching by local resource users.

10.4.4 Resource management

Precise concepts for the management of natural resources inside the TNP are missing, thus state institutions operating outside of the park also manage affairs inside the park. Use of forest resources and pastures is managed by local institutions and is poorly coordinated with the TNP authority. To this day the administration on the local and regional level is not able to work out a management plan for resources that is assessed in close cooperation with local residents and that combines conservation and use. Wildlife resources are managed by hunting companies in few spatially limited areas. Most resources however are not sufficiently managed by any authority or institution.

Many residents realise their responsibility towards the natural environment only when they assess a resource as important with respect to economic activities, whilst

at the same time the responsibility for the management of other resources is often delegated to the administration. Due to the difficult economic situation, decisions on land use are geared to short term benefits for subsistence and thus suppress sustainable alternatives. This handling does not often meet the understanding and awareness of conservation by local resource users, but may be explained by the lack of alternatives (*teresken*) or by provocations (trophy hunting).

Chapter 11

Comparison with another protected mountain area of Central Asia

In search of possible solution approaches that may contribute to a successful implementation of the TNP it may be helpful to gain a new perspective on the Pamirs by taking a look at other mountain areas of Central Asia. These mountain areas share many similar features with the Pamirs. Due to their aridity the land use system in these mountain areas is based on a combination of agriculture, horticulture and livestock breeding. Furthermore, they have to cope with the same Soviet heritage and during the transformation process their limited natural resources became seriously under threat by intense use.

The following chapter examines the Biosphere Reserve Issyk Kul, a concrete example that may point the way forward for the further development of the TNP. The concept of biosphere reserves according to the MAB project are outlined in chapter 4 and is not further described here.

11.1 The Biosphere Reserve Issyk Kul

The information given in this section is based on Gottschling (2002) and Umweltministerium Kirgistan (1998).

11.1.1 General conditions of the area

The natural elements

The Biosphere Reserve (BR) Issyk Kul is located around lake Issyk Kul in north-eastern Kyrgyzstan. The BR borders Kazakhstan in the north and China in the south and spans an area of 43,144 km^2 . The borders of the reserve run along the administrative border of the Issyk Kul *oblast*.

The lake covers an area of 623,600 ha. As a consequence of its great depth (700 metres), a low salinity and numerous hot springs, this lake never freezes in winter (thus its name: *issyk* stands for warm, hot). The lake is rich in various species of fish and constitutes an important habitat for migratory bird species. The area around the lake is classified as Ramsar Wetland. The lake is surrounded by the glaciated Tien Shan mountain range. As a consequence of the difference in elevation (from 1,600 m a.s.l. to 7,000 m a.s.l.), the BR contains a variety of ecosystems, ranging from deserts to alpine meadows. 1,400 out of 4,000 plant species growing in these habitats are assessed as being endemic to the region. The slopes north of the lake are covered with spruce forests and are home to the brown bear, the Siberian deer and the lynx. Endangered species such as the Marco Polo sheep inhabit the high

mountain steppes, the Siberian ibex and the snow leopard may be found in rocky habitats.

The cultural and socio-economic conditions

In 2001, about 427,000 people inhabited the reserve. They occupied 40% of the area, which includes three cities and about 400 villages. People are of different ethnic groups. Three quarters of the inhabitants are of Kyrgyz origin; minorities belong to the Russian, Kazakh, Uigur, Uzbek, Ukrain, German and other cultures.

Traditionally, most people make a living out of agriculture, horticulture and livestock breeding. Livestock is composed of sheep, horses, and few cattle. Yaks are kept at higher altitudes of the BR.

Tourism played an important economical role during Soviet time. The area along the lake was promoted as a resort for the urban population and was visited by about 700,000 people yearly. Therefore, it was protected as an ecologically important zone within several *zapovedniky*. Beside these strictly protected areas, *zakazniky* with less restrictive rules were established in this area. Forest areas were also strictly protected; nevertheless, intense grazing hindered their regeneration.

Further economic activities during the Soviet era included mining, light industry and manufacturing industry.

Developments after the collapse of the Soviet Union

Similar to the Pamirs, the area around lake Issyk Kul faced severe problems after attaining independence. The transformation process has a deep impact on the environment, the economy and society. Problems were no longer recognised and solved from 'above' and people had to take personal responsibility. They had little knowledge in farming and most of them were not able to manage the privatised land and livestock in a profitable manner. The livestock numbers of sheep, horses and cattle decreased rapidly. Fowl was introduced as a new species in many households. The decreasing number of sheep led to a decline of the grazing pressure on forest habitats. However, forests were intensively used as a fuel supply because the electricity supply became very unstable. As a consequence of lacking fertiliser and conflicts over water, the agricultural production decreased. The processing of farming products reached a minimum.

The tourism infrastructure was not fully privatised, but funds for the maintenance of the infrastructure were missing and the number of visitors declined rapidly.

Former marketing relations became lost. The industry suffered and most factories were closed. The only economic potential besides water was recognised in the numerous mineral sources. To bring urgently needed capital into the area, the state agreed to operate a huge gold mine together with a Canadian company. Today, this mine is located in the heart of the biosphere reserve and constitutes a serious threat to the environment and the resident people. However, its share in the GNP accounts for 18% (in 1998).

The formerly intensive work within the protected areas ebbed to a minimum. The numerous members of staff kept their jobs but could not be properly paid. The difficult economic situation led to increasing pressure on the natural resources and did not stop at the borders of protected areas. Poaching endangered species became a serious threat to the survival of the Marco Polo sheep and the snow leopard.

11.1.2 The project of the biosphere reserve

The project initiative

Facing a difficult economic situation after the collapse of the Soviet Union, the Kyrgyz Ministry of Environment (*gozkompriroda*) proposed to protect 20% of the country's territory. The focus was enlarged from strict nature conservation to the conservation of an historically grown cultural landscape.

Numerous Kyrgyz scientists, NGOs and the German Nature Protection Society (NABU) promoted this initiative. In 1995, the German government launched a bilateral project to support the establishment of the biosphere reserve. Numerous scientific projects followed, focusing on natural and social sciences. Their output helped to assess the condition of the natural environment and to analyse the perceptions and needs of the local population concerned. Thereby the project was named biosphere territory, since the term 'reserve' is associated with negative perceptions and only seen in relation with strict conservation. In 1997, several ministries, local administrations and Kyrgyz as well as foreign specialists were incorporated. A scientific group developed basic plans and the legal tools needed for the implementation of the reserve. Three model areas served as a base for the implementation of several small projects. However, these projects were of little effect and could not serve as starting points. One year later, the legal basis and an adequate administration were established to set up the biosphere reserve. Three years later, it was internationally accepted as Biosphere Reserve Issyk Kul through UNESCO.

Until 2004 the BR will be supported by the German government. The focus is set on promoting the build-up of the administration of the BR, to assist environmental management and public relations and to support the development of sustainable land use systems. In addition, different seminars and workshops are organised as training sessions with representatives of the administration, scientists and NGOs. Training is directed toward land-use systems and approaches involving participatory methods.

The goal of the biosphere reserve and its management concept

The goal of the reserve is to conserve the ecological stability and the cultural landscape, with both natural habitats and traditional culture and cultivation contributing to the ecological and economic requirements in the long run. The BR aspires the Kyrgyz population to revitalise and stabilise the land use system and to support tourism. The targets concerning an environmentally sound development are assessed and discussed with all stakeholders. The specification and location of different zones is based on detailed scientific data and conforms with the international criteria for biosphere reserves from MAB. The former protected areas within the biosphere reserve form its core zone, which makes up 1,410 km^2 . About 34,850 km^2 are assigned to the buffer zone. This zone includes all seasonally used grazing areas. 6,880 km^2 constitute the transition zone.

Local activities within the biosphere reserve

Several projects of the BR concern sustainable agriculture and livestock breeding, both of which are assessed as major issues in the area. Actual projects focus on improvements in the management of livestock grazing to prevent the area from soil degradation. Public relation work was enhanced by setting up an information centre and by issuing a biosphere reserve bulletin. Local initiatives and small-scale environmental projects are supported with a credit system. Furthermore, proposals have been formulated concerning the needed adaptations to the environmental laws.

The Biosphere Reserve Issyk Kul is a young project and many activities are still to be implemented, particularly a management plan for the core areas. Therefore an assessment of its influence on and consequences for the environment, its inhabitants and their economic situation is not yet published or available. However, so far the project is considered an effective example of how sustainable development can be combined with nature conservation and how the people concerned can participate in a large-scale project.

11.2 The Biosphere Reserve Issyk Kul: a case study for the TNP?

The remarks made in the previous section point out that the Biosphere Reserve Issyk Kul has at its disposal similar premises as the TNP with respect to the condition of its landscape ecosystems, its history, the identified stakeholders and the primary goals. The main differences may be found in the spatial dimension and the socio-economic setting: the TNP only covers two-thirds of the biosphere reserve's area. The BR itself is home to 80 times the inhabitants of the TNP. The economic activities within the BR are more diversified than within the TNP. Agriculture hold an important position, but tourism and industry are also present in the BR. Unlike the TNP the Issyk Kul area has long term experience in tourism at its disposal, since it had been promoted during Soviet era. As a consequence, local people are aware of the possible impact of tourism, both in terms of positive and negative developments. Light industry has a better chance to become established in the BR than within the TNP since its position offers a better supply of energy and is closer to markets. This diversification in economic activities may limit the dependency and thus the pressure on a single resource. However, the operation of one of the world's largest gold mines has to be assessed as a high potential ecological risk to the BR and its inhabitants. Following these differences it remains to analyse whether the TNP may contribute to regional economic improvements when most inhabited and cultivated areas are located outside the park, markets are far away and tourism never played a significant part in the economy.

In many respects the TNP complies with the postulation of a national park according to the IUCN. It is free of industry, only marginally populated and infrastructure is limited. However, with respect to international criteria of national parks, the TNP has some shortcomings too. The park is isolated from its surroundings and largely located in high mountain areas of barren land. Nature conservation is spatially separated from agriculture. This parallel arrangement hinders their integration within a sustainable regional development. The goals of the TNP administration as well as the targets as formulated by the different actor categories focus more on an economic development of the area than on nature conservation. Trophy hunting as well as other economic activities, such as the construction of dikes, is not allowed within a national park according to IUCN (cf. IUCN et al., 1994).

With respect to these different concepts, the TNP has to be assessed as a national park with respect to its area but as biosphere reserve with respect to its goals. As a whole it constitutes neither the one nor the other. The official goals of the TNP point out that the responsible institutions are aware of the shortcomings in today's nature conservation network. However, ideas concerning the implementation of these goals are poorly developed. Despite the fact that they mean well, the responsible institutions seem to struggle with the realisation of the park because of the difficult reality. These shortcomings demand them to reconsider the goals of the TNP. May the park be realised with respect to the selected area or does the demarcated area of the park ask for a better setting and revision of the targets? Considerations concerning the appropriate management category, respectively the

concept of conservation, should thereby be included.

From a personal viewpoint the biosphere reserve is assessed as a valuable concept for the future of the TNP. It combines the goals of a national park, a protected landscape area and a regional park in different zones and thus may contribute to both conservation and economic development. The combination of different forms of conservation and use which are all managed and coordinated by the same administration within the BR is a great plus of this concept, contributing as it does to an holistic perception of the purpose of a sustainable regional development.

Chapter 12

Requirements for the implementation of sustainable resource use within the TNP

In the following chapter the author assesses from her own perspective what steps are required to implement an ecological sustainable development in the TNP. In doing so she takes into due consideration the widely differing needs and expectations of the various actor categories. In this respect the question is not asked whether the TNP constitutes a viable option in contributing to a sustainable regional development, but instead what a sustainable development in the TNP could look like. These ideas are derived from the numerous discussions held with various stakeholders and actors from different levels during the field season and afterwards, personal ideas, and proposals mentioned in literature (mainly Smith and Martin, 2000; Gottschling, 2002).

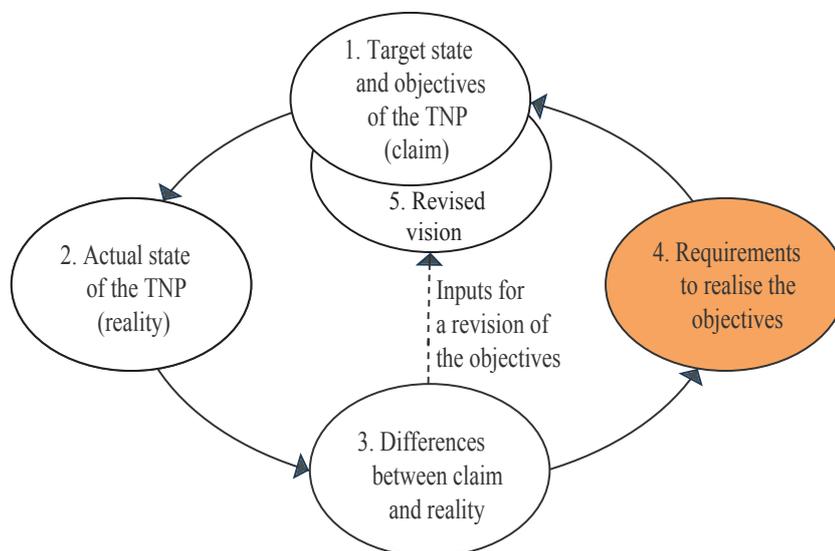


Figure 12.1: Step 4 - Appraisal of requirements to realise the claim of the TNP (own illustration).

It is important to note that according to Wiesmann (1995), the values of the present and the future state addressing the three spheres of sustainable development have to be assessed and negotiated on the local level. These negotiations help to appraise concrete steps for the implementation of the park, but may also induce a revision of the objectives in order to assess a common vision about the TNP (cf. figure 12.1). Since this synthesis is assessed from an outside perspective it may only

serve as a source of input to support these negotiations, but it cannot substitute them.

Section 12.1 focuses on enabling factors and recommendations for the proceeding of the TNP with respect to all spheres of development. The main attention is thereby turned to the use of resources since this demonstrates the focus of this thesis. Section 12.2 appraises concrete proposals for further action addressed to different actor categories.

12.1 Enabling factors for the implementation of the TNP

12.1.1 Political will

The following points are important requirements for the strengthening of the political will that determines the degree of **commitment of various actor categories** to sustainable use of resources:

- Recognition of the **long-term benefits of biodiversity** and the habitats that sustain it
- Recognition of how conservation and sustainable uses of biological resources can meet **development objectives**
- Recognition of how extractive and exploitative economic uses can undermine **long-term well-being** (Smith and Martin, 2000).

To this end, **ecological education** among administrative levels and local resource users has to be promoted by the TNP.

Local actor categories are the key stakeholders of conservation and need specific consideration from the political institutions. **Political processes must be opened** to give voice to all stakeholders. If the means are provided for stakeholders to participate in, and have control over, decision-making about natural resources, this would undoubtedly increase their commitment at different levels.

12.1.2 Awareness

Basic understanding of the importance of ecologically sustainable development for the single actor, for society as a whole and for future generations is dependent on **information about biodiversity and conservation** and on the relationship of different actor categories with the **natural heritage** of their environment. Only people taking pride in their natural heritage may be mobilised for the conservation of these values. Thereby the **cultural background** marks an important precondition for the appreciation of nature and therefore of nature conservation issues. It thus follows that the concept of management of the TNP may only be accepted and function if it takes the cultural background of the people living in the Pamirs into consideration. In addition, only when local people recognise their own interests in the targets of the TNP may they identify with this project and support it.

Awareness of the **costs and benefits of nature conservation** should be promoted among all stakeholders by means of public relations. The set-up of an **information centre** could be hugely beneficial in raising public interest and awareness. Options of such a centre are assessed in

- **environmental education:** Educational programmes can demonstrate to people that natural resources are not inexhaustible and biodiversity is not limited to the park; sustainable development does not only focus on nature conservation which does not automatically mean additional costs, lower yields or less benefits for local resource users

- **motivating local people for conservation** with idealistic arguments rather than with rational scientific arguments
- **presenting the project of the TNP** with its aims but also its limits
- **publishing results of the latest research** and creating an info bulletin as a platform for all stakeholders.

This information centre could furthermore increase the awareness of tour operators, urban residents visiting the area and trophy hunters. These actor categories must become aware that their handling may have great impact on government policies as well as provoking reactions by resident people (e.g. trophy hunting promotes poaching by local people).

An important feature in raising awareness is seen in the **assessment of dimensions**. The TNP authority has to inform the public that the goals of the TNP focus on a long-term perspective. Spatial scales concerning the park area and the extensions of different zones have to be assessed and clarified in the beginning of the further proceeding.

12.1.3 Capacity building

Capacity building is assessed as an important precondition to **increase efficiency** and limit future conflict in the management of resources within the TNP. Institutions and people have to increase their responsibility for the conservation of natural resources and biodiversity. They have to inform and organise themselves in such a way that they can influence policy making and conservation activities and thus be able to translate the above described awareness into effective action. To this end capacity must be furthered on all levels. The TNP may contribute to this requirement by

- **analysing policies** and scientific research within the park
- **promoting learning** and environmental education
- **managing resources** and institutions within the park
- **assuring transparency** and accountability of public and private transactions
- **mobilising support for conservation** and resolving conflicts between various stakeholders
- **enforcing legal environmental regulations** within the park
- **establishing partnerships** with diverse stakeholders
- **creating political space for multilevel and multi-stakeholder negotiations** concerning conservation targets and sustainable regional development.

Capacity building within the TNP calls for **enlarging the staff with specialists other than natural scientists**, such as landscape planners, educators, publicists, and designers.

In order that the TNP can assume an active role in supporting local development, those who are most affected by the park should become directly involved in its organisation and management. This implies that **local people are emancipated and empowered** to formulate their needs and take part in the decision making and management of natural resources. Furthermore, capacity building of local communities inside and outside the park may **enhance productivity and support local products** coming from the pastures and fields to strengthen the financial capacity

of local communities so that they could become more self-reliant in meeting their needs. This would reduce the pressures on several natural resources such as wildlife and *teresken*.

12.1.4 Policy and legal framework

Macroeconomics, transportation, tourism and agricultural policies have stronger effects on the ecology than environmental policies. As a consequence, conservation of natural resources and biodiversity has to be created in such a way that it constitutes an opportunity for economic, social and ecological development. Thus it is important to **integrate concerns about conservation into all policies** and coordinate them in overall national development plans. It is important to realise that conservation is not only the concern of nature conservation departments.

The legal framework and regulations which are outside conditions for the design of the TNP as well as internal instruments such as the enactment of additional laws, should be carefully used as **instruments to solve conflicts** concerning the TNP. The increase in the number of regulations within the TNP, however, may increase the impression that the park serves merely as an instrument of the policy makers to prohibit numerous actions and limit the scope of local resource users. Therefore, investigations should be made into how to develop sound planning and moderation of resource use and conservation within the TNP without an unnecessary increase in legal regulations.

Existing regulations concerning nature conservation and management of protected areas must be **coordinated by a central institution** but enforced in a decentralised manner. All protected areas of Tajikistan belonging to the same category should get a minimal set of binding legal regulations. To supersede the present confusing legal arrangement, this set of regulations must **adopt international classification systems** based on management objectives. A **decentralised policy making and enforcement** of the existing law should increase the accountability of different stakeholders and thus support the enactment of environmental regulations within the TNP.

An important legally enforced regulation should include the **charging of fees** by the park authority and local actor categories. Fees can help regulate the number of visitors, the type of visitor and the season in which they come. They can also be used to distinguish zones and access to areas by local resource users and 'outsiders'. These regulations concerning access to the park area may safeguard local resource uses from exploitation or insensitive treatment by outside interests (e.g. trophy hunting and mining) and thus may support culturally and ecologically sound economic activities inside the park. Fundamental to the successful introduction of fees are mechanisms of collection and distribution, and the questions about who receives the income from the fees, who decides how fees should be spent, what is the level of fees charged and for what purpose the fees are charged.

Beside formal regulations, voluntary regulations and **codes of conduct** should be promoted. They are assessed as being the most cost-effective method to minimise negative environmental and social impacts. These voluntary regulations, however, strongly depend on participation of all stakeholders in their development and implementation. Contracts between different actor categories should be promoted to control the pricing of services and products. They may help to ensure economic returns that encourage investment into conserving such natural resources.

12.1.5 Use of resources

It is important that new concepts of land use within the TNP are fostered in order to allow the local population the continued practice of traditional use of resources in

combination with conservation. **Establish a sustainable land use system** may help to conserve natural resources and biodiversity since it increases the efficiency of the resource use and thus may reduce the impact on other resources. As an overall goal, biodiversity and resource conservation has to be integrated with all other forms of land use, even though most of them are located outside the TNP.

Strict protection of certain species and habitats should only be realised in core areas of the park. The former sanctuaries included in the TNP constitute valuable options to be assessed as core zones. However, since they have always been impacted by human use and since they do not represent habitats, flora and fauna species included into the TNP to a full extent, don't include the most diverse areas and the most threatened ones, the location of the core zones has to be analysed carefully. These areas have to be linked with other protected areas in the Pamirs via corridors. The park, or at least the core zones, should be surrounded by a buffer area to render the impact of human use more gradual.

The zoning should not only focus on a spatial structure but include temporal aspects. Certain zones for example may be strictly protected during a certain season but accessible for limited use during another season.

Local resource users and other actor categories have to realise their personal responsibility with respect to the use and protection of resources. Therefore, local people should not only be included in the discussion about the implementation of the TNP, but also play an active part in the management of wildlife and other resources within the park. They need to learn to handle natural resources similar to livestock and agricultural products. To demonstrate this with an example, Marco Polo sheep could be held in a sort of farm. There they would constitute a source of meat and could be harvested without having an impact on the whole population. Such a project could sensitise local people for nature conservation and at the same time promote alternative sources of income. To this end, local people need to be assured that costs and benefits of maintenance of biodiversity and natural resources are equitably balanced between all those actor categories who use and/or benefit from them.

Livestock breeding

Mobile livestock breeding is a highly evolved ecological response to seasonally scarce resources, well adapted to dry mountain areas, and constitutes an important eco-social system of livelihoods and the husbanding of natural resources. Furthermore it shows features that are assessed as important for the conservation of grassland resources, such as **rotational grazing**, organised management of winter pastures, diversification of livestock herds. Therefore, this traditional form of land use should **revitalised and intensified**.

To minimise the negative impact of livestock on grassland and thus to reduce degradation of soil and vegetation, **the number of livestock should be geared to the capacity of pastures** to produce fodder and still be able to recover. A specific zone of the TNP or its buffer area could be used to demonstrate the potential productivity and the number of animals best adapted to the habitat that an area in good condition can carry without damage (Dasmann and Poore, 1979). With respect to the drastic decline of livestock numbers after independence, it seems quite possible to increase the present numbers. The following processes could be helpful in achieving this objective:

- **Reducing the grazing pressure on winter pastures:** Livestock should be evenly distributed among the limited winter pastures. Pastures on steep slopes should not be used since they constitute critical areas of degradation and natural hazards. A promotion of the cultivation of forage could reduce

pressures on hay fields and winter pastures and guarantee the survival of the stock even in hard winters. This requires investments in water infrastructure, enlargement of watered and cultivated areas, rise in the output of crops as well as specific user rights for winter pastures.

- **Increasing the use of summer pastures:** The use of high pastures in summer should be prolonged. Investigation of grassland should help to estimate the potential pasture areas and to develop suitable management plans. Thereby the actual and possible grazing grounds of wild ungulates have to be taken into consideration to reduce the competition of livestock with wildlife for the fodder supply. An **even distribution of livestock on pastures** and an **increasing mobility** of herders will reduce the impact on pastures located around villages. This demands investment in joint management and the organisation of private herders in cooperatives. Especially farmer associations should assume an important role. Furthermore, equal access rights to pastures have to be given to all herders and at the same time remote areas have to be made accessible. This could be realised by collaboratively acquiring trucks and gasoline and maintaining **peripheral supply stations**. The latter should be organised in a mobile manner to be able to follow the herders which change pastures depending on the number of animals.
- **Offering access to long-term credits:** Herders need to get the chance to enlarge their stock numbers and to invest in fodder production. The present credit system only offers short-term credits, which most herders find inadequate for their purpose.
- **Increasing livestock numbers:** Yaks provide numerous products such as meat, dairy products and wool that are widely used for different purposes. Yaks do not graze the vegetation as short as sheep and therefore cause little degradation. This objective is closely related to the previous one focusing on long-term credits. Yaks, however, have some limiting points. Their reproduction rate is small and their meat is of low value at the bazaar. Thus, also the numbers of sheep should be promoted. The introduction of new species, mainly special sorts of sheep and goats to produce not only meat but good quality wool, has to be carefully analysed. Species that are not adapted to dry, high mountain habitats may cause intense degradation processes or interact with wildlife in a negative manner (e.g. transmission of diseases). Investigations in small livestock such as fowl could bring new options for families with little livestock and diversify the menu of the local people.
- **Fostering access to predictable markets:** Livestock of the Eastern Pamirs is often traded on Kyrgyz markets. Marketing barriers and bottlenecks hinder local people to improve their market relations.

Agriculture

Agricultural areas in the Pamirs harbour a variety of agricultural crops and wild relatives of these species, which provide food, forage, decoration and raw materials. According to Badenkov (1991), **wild species offer unique opportunities for selection of new drought- and disease-resistant varieties**. However, due to cultivation of new species, wild relatives of crops may become supplanted. The inclusion of agricultural areas into the TNP could help to limit unadapted land use or the cultivation of alien species and at the same time contribute to the conservation of the agricultural gene pool.

In the remote area of the upper Bartang valley, agriculture is conducted only around the villages. The output is used for self-sufficiency and not sold on a market.

Markets, moreover, are far away and means of transport are not present. However, the actual situation also provides some assets. Local people promote traditional crop species and due to limited access to chemicals, they mainly use organic fertilizer on their fields. This constitutes a good base for the promotion of ecological cultivation. The following points highlight requirements for an ecological and viable cultivation.

- **Fostering balanced crop rotation:** Balances in crop rotation are important to maintain the soil fertility. Crop rotation produces the fodder needed in livestock breeding. Training of local people by specialists should raise these ecological relations and educate people in the treatment of crop pests.
- **Improving irrigation:** Agriculture is not possible without irrigation in the Pamirs. In arid climates, irrigation has to be combined with drainage. Local people need support in order to improve the network of water channels and to establish necessary measures to prevent erosion along water channels.
- **Improving the supply of agricultural instruments:** All work on the fields and the processing of the agricultural output is done by hand. Technical support is scarce and thus the work is very time consuming. Support should not focus on the re-introduction of Soviet machinery, but on the promotion of small instruments such as ploughs and harrows.
- **Improving access to markets and agricultural products:** Investment in certain crop species could produce an increased output which may be sold on the market. The access to markets, however, is very limited as mentioned above. Areas with little livestock should get better access to organic fertiliser.
- **Promote niche products:** Diversification of household strategies in the use of resources should be promoted. Many natural resources may be used in different manners, pastures should not only be used for livestock herding, but also serve as grounds on which medical herbs are grown, as bases for trekking with tourists or wildlife-sightseeing. Furthermore, resources should be processed locally and not exported as raw materials like in the Soviet era. Wool can be used to produce handicrafts and foster the economic activities of women. Meat and milk should be processed and preserved for the long winters.

The requirements listed above aim for **increasing regional cooperation and diversification in resource use** on the household level. Crop rotation only makes sense if the produced winter fodder reduces the pressures on winter pastures. Since agriculture is not realisable in the eastern part of the TNP, the trade of farming products between stock-breeders and tillers should be nurtured. This trading could mitigate the problem of large distances to markets. In addition, increasing cooperation between the inhabitants of the Eastern and Western Pamirs could positively contribute to cultural understanding and acceptance.

Forests and bush land

Forests and bush lands are strongly affected by human use. Their proper maintenance and conservation is assessed as one of the biggest challenges of the Pamirs. However, since only little forest areas are included into the park, the contribution of the TNP to forest conservation may be limited. The main requirement to reduce the pressure on forest and wood resources may be found in the **promotion of alternative sources of energy**¹. To have a certain amount of wood at one's disposal for

¹This problem is addressed by Deoux, R. and Hoeck, T. (in progress). Energy Situation in the Tajik Pamirs (GBAO) and its Consequences for Land Use and Resource Management. Master's thesis, Institute of Geography, University of Berne.

construction and fuel, fast-growing tree species should be afforested at several locations, also outside the park area. The use of forest resources and woody sub-shrubs should be strictly regulated and controlled. Furthermore, former forest habitats should be afforested with local species to prevent the slopes from degradation and to preserve the diversity of mountain forest habitats.

Forests and bush lands provide numerous **non-wood resources**, such as fruits and berries. The use and processing of these products should be fostered at a sustainable level. Particularly the berries of sea buckthorn, which are common along major rivers below 3,500 m a.s.l., may serve as an important source of vitamins for children.

Wildlife

Since the use of wildlife resources and in particular of Marco Polo sheep is assessed as very delicate, the following remarks are given specific importance.

Wildlife of the Pamirs is a national and international treasure with great potential for the tourism industry and self-sufficiency. However, only where population data indicate it is appropriate and only when they create conservation actions that work in favour of wildlife and their habitats, limited hunting programs may be considered for both trophy hunting tourists and local people. The production of animals for subsistence harvesting requires populations capable of sustaining the harvest, while the production of trophy animals (Marco Polo sheep) requires a large population size and good quality habitats. Because the density of Marco Polo sheep is very low, the **calculation of the number of animals** may easily exceed the actual number and thus lead to an inadequate number of licences sold to hunting firms and local people. To be able to set the quotas for hunting on a sustainable level, it is important not only to know the number of animals, but also their age distribution, the home range sizes of wild ungulates hunted for trophies and food and the influence of hunting on the spatial use and displacement of them (Shackleton and Group, 1997). A regularly census should be made along properly selected transects that cover the major habitats of the species. To avoid embellishment of the data the census should be done from people not involved in the hunting business.

Hunting should not be an exclusive right of foreign trophy hunters, also hunting by local people should be made legal. **Subsistence hunting can be combined with trophy hunting** in the Pamirs. The duration of the hunting season should be restricted for both locals and tourists. No hunting should take place in mid to late winter, because animals are in poor condition, which makes them vulnerable to disturbance. Shackleton mentions "in order to make trophy hunting economically viable for the professional outfitters, the hunting season should last for a minimum of six weeks, but not extend beyond ten weeks" (1997, p. 368). Preferably, hunting for trophies and for subsistence should not take place at the same time, as they may interfere with each other. The management of wildlife should be combined with that of domestic stock to allow the optimal regulation of both and to avoid conflicts.

Due to the high monetary value of trophy animals like Marco Polo sheep, temptation may be too great to view trophy hunting primarily as an **instrument to generate foreign exchange**. Even though trophy hunting brings foreign currencies into the country and commercial enterprise partnerships with western companies, **local people as well need to receive substantial economic benefit from international hunting**. It is difficult to get support for conservation from local people if they are banned from hunting what they are told are threatened animals, while at the same time, foreigners are allowed to hunt these species.

Trophy hunting may lead to a negative selection of animals and thus reduces the fitness of the population. Therefore, scientific investigations and monitoring are necessary to analyse the **tolerance of trophy hunting**. Only hunting compa-

nies that follow the official regulations and perceive their responsibility in terms of the wildlife and the local population, should be **certified from an independent organisation**.

According to Shackleton (1997), the best long-term solution for stemming illegal and unsustainable hunting by local people is to **foster a sense of proprietorship** to the wildlife resource from which they obtain sustainable benefits. Bringing subsistence use under effective control is a complex problem that will require a serious effort in understanding the roots of the problem and in working with local people so as to find solutions rather than to control them from centralised offices. Furthermore, any restrictions on traditional land use (control of livestock, cessation of subsistence hunting) need to be compensated for in the form of tangible benefits for local people. To realise a sustainable use of wildlife resources, a set of measures focusing on incentives, regulations, spatial planning and organisational measures has to be assessed with all stakeholders. Table 12.1 points out the importance to integrate such measures into different spheres.

Table 12.1: Measures to promote a sustainable use of wildlife resources (based on Bütschi et al., 1996 and own field data).

Measures	Incentive	Regulation	Spatial planning	Organisational measures
Sphere				
Hunt	hunting licences for locals	hunting licences and season	hunting areas	organisation of hunters, education
Tourism	provision of services, jobs	limited number of licences	hunting areas	cooperation with local hunters
Wildlife	work out alternative uses of wildlife		separate areas for strict protection	
Infrastructure		gun licences	hunting areas with game-keeper stations	
Pastures	compensation for limited use, mobile supply stations	livestock partially herded without dogs, schedule	pasture use only in certain areas, use zoning plan	fusion of herders
Research	external relations, support, cooperation	public education, applied research	research stations	publication of findings
Basic conditions	alternative sources for income generation		networking of protected areas	empowerment, coordination

IUCN discusses various options to conserve wildlife species, such as Marco Polo sheep and Asiatic ibex, and their habitats (Shackleton, 1997). In the following their acceptability with respect to the TNP is briefly discussed:

- **Total protection:** This option depends on a strong, clear legislative framework, sufficient trained staff and adequate resources to enforce protection effectively. This form of protection is assessed as valuable for the core zone(s) of the TNP.
- **Subsistence hunting:** This option has strong potential for supporting wildlife conservation, because subsistence hunters are mainly locals. It provides an alternative or supplementary means of productive land use, fills various needs and thereby can be consistent with and encourage conservation efforts by both local people and national institutes. To be successful, this option should involve local users in the decision-making and planning process as well as into management responsibilities. Furthermore, it needs implemented management and control on resource use. Over-harvesting has to be prevented because this would lead to rapidly reduced populations, or even drive a species to extinction, thus reducing or eliminating chances of recovery. Benefits derived from the sustainable use of wildlife must be channelled back to local communities. Subsistence hunting does not include commercial or market hunting of some species. Subsistence hunting may be conducted in the buffer zone around the TNP and within limited areas inside the park, particularly in sensitive areas, where it may be necessary to exclude domestic stock.
- **Trophy hunting:** This is the option with the greatest potential in cost-recovery abilities. Effective, sustainable trophy hunting programs, in which foreign hunters are brought in, and the resulting financial benefits are directed to both local people (wildlife guards, hunting guides etc.) and to wildlife conservation (tangible, significant benefits for animals and their habitat) are very difficult to establish. For practical purposes it is often easier to identify and eliminate unsustainable approaches than to describe sustainability. Before sustainable trophy hunting programs can be developed, extensive wildlife surveys are required (Shackleton, 1997). Finally, trophy-hunting programs have to provide quality animals for the hunter. Trophy hunting is not compatible with a national park according to the management regulations of IUCN and may not be conducted in any zone within the TNP.
- **Non-consumptive use:** The potential of activities like eco-tourism and wildlife viewing safaris for wildlife is relatively unknown but is thought to have limited value for conservation. However, particularly Marco Polo sheep are estimated to be easily observable and become used to human presence when effectively protected from hunting and poaching and thus may become a major tourist attraction in the Pamirs. This activity could be conducted during summer (main tourist season) within specific zones of the TNP.
- **Captive breeding:** This may be considered a 'last-resort' option, partly because of its usually high costs and also because of an inadequate infrastructure in this area. Experiments show varying levels of success (Shackleton, 1997). Captive breeding as an instrument to protect wildlife is not compatible with the TNP. However, it may constitute an option with respect to sustainable management of captured Marco Polo sheep similar to livestock. New possibilities are to combine domestic and wild animals and to farm previously undomesticated herbivores (see below).

Tourism

Tourism is not established in the Pamirs and particularly international tourism has no tradition within this area. However, the natural **potential of the Pamirs for recreation** is quite diversified; favourable environments exist for sports and

convalescence, mountain skiing and mountain climbing. New forms of tourism, such as eco-tourism, seek to take care of not to alter the integrity of the ecosystems, to minimise negative environmental impact, while at the same time producing economic opportunities that make the conservation of natural resources beneficial to local people. As a heritage from the Soviet management of protected areas, tourism is considered one of the rationales for the establishment of the TNP.

The challenges of tourism within the TNP are seen in (1) the **inclusion of environmental aspects** into tourism projects, (2) the **establishment of a network of infrastructure** including transportation, (3) the development of special programmes and activities to stamp tourism within the TNP with an **individual note** (tourism in the TNP should not offer the same as tourism in similar areas outside the region), (4) the **participation of local people**, (5) the **promotion of training** and (6) the **guidance of tourists** (tourists should not spread over the whole area) as well as (7) the handling of the **need in energy**. Tourism has to include a variety of people and should not only serve as an option for rich locals and 'outsiders'. The money derived from this industry should be available for local budgets and not leave the area to end up in the lowlands.

Similarly to local and national actor categories, tourists have to be aware of the values of biodiversity and natural resources. Therefore they should have the possibility to become informed on site about the specific conditions within the Pamirs. This could be realised in **information centres** that are located outside the TNP. The former research station in Checkety for example could be reconstructed and installed as an information centre and natural museum (promoted particularly by ACTED eco-tourism project). Only tourists who have visited such information centres should then be given a licence to visit the TNP. At the same time this centre could be used to promote ecological education amongst local people.

Even though tourism constitutes an alternative form of resource use that may help to diversify the income strategies of local households, people need to be aware that unlike agriculture and livestock breeding, the **income derived from tourism is highly unpredictable** and influenced by numerous factors coming from outside the area (e.g. access regulations, frontiers and transport offers). Events such as the war in Afghanistan had deep impacts on the tourism industry in neighbouring countries and forced many people to re-adopt their activities in agriculture. This is only possible if agriculture has been continued alongside tourism; people who had sold their livestock faced serious troubles (oral information from H. Kreutzmann, January 2003). This example points out that traditional land use methods should constitute the basis of the economy even when new forms of income generation are introduced. Concluding the TNP has to be assessed as a facility to support tourism, but should not be rated as the main promoter of tourism.

12.1.6 Financial resources

The future existence of the TNP is only possible with proper funding. Costs include the establishment and management of the park, the financing of incentives, the promotion of sustainable uses of biodiversity and natural resources and the monitoring of biodiversity.

The much-needed finances should be **generated from diverse sources**, including the state and the private sector. Another source of funding are user and service fees, private donations and the international community.

Cost-sharing in the administration of the park and between the numerous departments dealing with resource use should be fostered to **increase the cost efficiency in conservation**. Thereby **transparency of financial flows** is important to reduce corruption. Cooperation between the departments should guarantee to earmark and use fees for specific resource management priorities. In addition, in-

creasing cooperation is needed between the administration, local communities and NGOs so that all of them are willing to play a significant role in collecting funds. Therefore, the government should guarantee that the local communities reclaim a certain amount of these funds for conservation activities on a local level.

12.1.7 Science and information

Science is assessed as important to make available basic information for decision-making. Therefore, scientific projects should be addressed to key problems faced by policy makers and the institutions commissioned with conservation issues.

Broad investigations are needed to **update and assess inventories concerning the ecological and socio-economic situation in the Pamirs**. Further investigations in socio-economic and political processes and dynamics are needed since these are the root causes for conservation. Therefore also **scientific projects outside the dominant natural sciences** should be performed within the TNP. Alternative uses of resources should be analysed, such as sustainable use of wildlife and the potential of medical plants for local medicine. Recommendations concerning ecologically sustainable land use methods should be published in manuals and thus become available for local resource users.

To **make use of the huge and long-term data collected during the Soviet period**, the data stored in Moscow and different institutes in Tajikistan need to be made available to today's scientists. A synthesis of the disciplinary data could serve as an initial point for the identification of further scientific projects. These should also make use of western concepts of interdisciplinary, multilevel and multi-stakeholder approaches.

Furthermore, scientific work should help to **establish a monitoring system** within the TNP. This is assessed as important tool to evaluate the impact of the park on biodiversity conservation, economy and the livelihood of its inhabitants. To this end, the coordination and exchange of data with other protected areas has to be furthered on an international level. To realise this, data need to be comparable. This may be achieved by the application of new methods set up according to international standards.

The TNP demonstrates an option to **link, store and update scientific data in a central network** making use of modern techniques. The park should assist the **publishing of the results** of studies carried out within its area. This would make information available for society as a whole.

12.1.8 International context

The international context influences the national, regional and even local actions in both an indirect and direct manner by setting the 'rules of the game', e.g. the predominant model of 'development' which influences international markets and by acting directly via international institutions and NGOs.

International organisations can help to make conservation issues part of the national policy and thus **support the adoption of international conventions** such as the CBD. **Long-term development projects** of international organisations, such as the GEF project on Sustainable Land Management in the High Pamir and Pamir-Alai Mountains (see GEF, 2003), are important for (1) **capacity building**, (2) **financing** activities focusing on conservation, (3) promoting **technical support**, (4) **mainstreaming sustainable approaches** in concerned policies and institutions, (5) promoting **learning from experience** and (6) creating options to **further the dialogue** between different actors. On the local and regional scale international NGOs may support the negotiating capacity of different stakeholders. As outside agencies they can play an important role by strengthening the hand of the

conservation community in the debate over development approaches and resources. These remarks point out that the international community can and should play a significant role in sustaining conservation beyond the provision of financial resources. However, financial resources are needed to strengthen the ability of national, regional and local actors in realising investment in nature conservation.

According to the TNP authority, there are plans to enlarge the TNP into the Kyrgyz republic and into China to turn the park into an international transborder peace park. This project could increase international cooperation on different administrative levels and may foster the joint solution of cross-border environmental problems. Furthermore it could help to harmonize the legal frameworks concerning nature conservation among these countries and allow to re-adopt old forms of mobile livestock breeding in areas where access was formerly denied (especially along the Tajik - Chinese border). However, bearing in mind the challenges of the TNP in its present situation it is assessed as too early to invest in a larger project yet. Only once the TNP is implemented may it serve as a good example for a regionally sustainable development. Therefore the TNP needs a successful implementation and a strong lobby that popularise the project on an international level.

12.2 Recommendations for different actor categories

12.2.1 Local resource users

As a consequence of their intensive use of resources, local resource users should **accept their responsibility for the state of these resources**. They have to get active and interested in conservation and sustainable development and therefore should stop awaiting 'ruling from above' but **organise themselves in interest groups** and build up networks on a local level. This is assessed as an important prerequisite for their participation in the planning, organisation and management of the TNP.

Environmental education and a **revitalisation of the traditional knowledge** are important for those most directly concerned with natural resources. The challenge of local people is to **take advantage of opportunities created by the TNP**. They should make use of the options of small credits offered by various NGOs to invest in improving their resource use. They should be proactive and help to assess alternative uses of resources and invest in new products for new markets. A combination of traditional handicrafts with newer design or materials could open new markets in the tourism industry. Strategies to process and preserve dairy products and fish have to be tested and applied.

12.2.2 Administration on different levels

With respect to the TNP, but also to conservation in general, the different institutions and departments dealing with the management of resources have to redefine and **reorganise their tasks** and adjust them to one another. Efficiency should be strengthened by **enhancing the cooperation between and within the departments** with respect to the organisation and use of financial resources. Huge investments are needed to promote transparency and simplify processes.

Projects of environmental institutions need to be tailored to local abilities and time-scales. The administration needs to provide local actors that are asked to give up traditional resource uses the confidence that there will be an even distribution of the sacrifices and benefits inherent in conservation.

12.2.3 Park authority

The quality of the TNP is strongly influenced by the quality of its management. Therefore, the TNP authority should primarily invest in the **development of a sound management plan for the park**. Thereby they have to establish a participatory process in which all stakeholders are included. This participation should not stop after the TNP is established, but be continued within the management of resources of the park.

It is seen as a task of the TNP authority to **create incentives for all actor categories for conservation efforts**. Thereby the park authority has to recognise that wildlife has a value beyond economic terms for local people. Furthermore, **environmental education** is assessed as an important duty of the park authority to raise public awareness. This could be assisted by the promotion of small exemplary projects that demonstrate and confirm the ideas about the park. These projects would help different stakeholders to encounter the TNP in a positive manner and demonstrate that changes in resource management can deliver both greater biodiversity and increased or at least maintained levels of output by avoiding losses due to over-use.

However, different actor categories can only be stimulated to support the TNP if they are properly informed. Thus the park authority has to **establish an information centre and publish up-to-date information** about the situation of the TNP with different media. In the future, such an information centre could be expanded to a service centre that provides advisory services concerning the use and protection of resources for different actor categories, such as local resource users and tour operators.

The huge area of the TNP needs about 259 field staff² to guarantee the fulfilment of its tasks. The **selection of these members of staff** should consider local people from all cultures. There will be a need to invest in cooperation between the park staff, the administration and the park authority. To further the experience of the staff, the TNP authority should **organise training sessions and exchange schemes with staff from other protected areas** in Central Asia.

Further tasks of the TNP authority are identified with respect to monitoring and the promoting local products. **Monitoring** should be carried out in cooperation with science (see below) and focus on both natural and cultural values. Ongoing monitoring is also needed to evaluate experiences made during the project. These experiences could support the planning of further activities within the TNP and in other protected areas. Once established, the TNP may serve as an instrument to label local products and to sell them on markets outside the park. The **promotion of such regional products** and the **creation of a marketing strategy** are future tasks of the TNP authority.

12.2.4 Scientists

Scientists should focus their projects on relevant questions related to the TNP, such as:

- analysing the carrying capacity and options for reproduction of different pastures and options to improve grassland productivity
- analysing livestock dynamics and their impact on pastures, assessing the tolerated number of livestock for various pastures

²According to the United Nations List of National Parks and Equivalent Reserves, parks with less than 50 inhabitant per square kilometre need one fully employed person per 100 square kilometre. From this it follows that the TNP should engage 259 people (IUCN, 1971).

- updating census data on different wildlife species with the use of adequate methods and develop management options for wildlife with respect to their sustainable use
- analysing indigenous and traditional knowledge in resource conservation
- analysing the impact of different alternative and present land use methods on mountain ecosystems and assess the present land use potential
- analysing the impact of development projects on nature and the local population, such as the construction of a dyke at lake Yashilkul
- analysing conditions and opportunities concerning a participative planning of land use
- analysing the potential of small instruments such as ploughs to increase the agricultural output and to enhance efficiency, assessing options to manufacture such instruments within the region and investing in technologies for mountain agriculture in general
- analysing alternative sources of energy for the Western and the Eastern Pamirs as well as techniques to raise the efficiency in the use of energy (insulation of houses, improvement of ovens etc.)
- analysing options to preserve local food resources and assess alternatives, such as the production of cheese in the Eastern Pamirs and the development of beekeeping in the Western Pamirs
- analysing the dynamics of different natural resources making use of GIS technology
- assessing guidelines for the tourism industry to limit possible negative impacts on nature and society
- analysing acceptance and perceptions of different actor categories for the TNP.

The data used for these analyses should be collected in the field, but must also take into account former data from the Soviet era, observations from park staff, weather stations and hunters. Furthermore, **methods of data collection should be diversified** and include digital aerial photos, satellite images, field surveys, interviews and participatory workshops.

Beside the implementation of concrete research projects, scientists should also **focus on long-term monitoring of ecological processes and impacts on and from the TNP on the environment and society**. Monitoring includes (1) continuously up-dating the data base, (2) analysing the status and trends of natural resources, habitats and the economic situation, (3) compiling a regular (yearly) census of game animals and their habitat conditions, (4) assessing the flora and ecological processes and (5) the impact of human use on resources.

Scientists should no longer regard their activities as separate from the political and social spheres. They should **strengthen their cooperation** with each other, with the administration, the TNP authority and NGOs. They should make investigations into integrating multidisciplinary research that is specifically oriented toward sustainable development. Furthermore, they should support the TNP authority in working out a sound management plan for the TNP.

Foreign scientists should promote cooperation with national universities and focus their projects on the needs of different actor categories. It is assessed as delicate and ineffective when big budget international scientific projects only focus on large scale projects or pure natural science. International scientists have to **invest time**

to identify the roots of the problems and then engage in finding innovative solutions to solve these problems. It is self-evident that such projects need to pay specific attention to cultural and regional characteristics.

12.2.5 NGOs and international community

International organisations and NGOs can **play an important role as outside agencies**. They can (1) strengthen the hand of the local conservation communities in the debate over development approaches and resources, (2) support negotiations, (3) serve as mediator between different stakeholders and actor groups and (4) provide technical support for those who have no access to it. International NGOs should **invest in the empowerment and organisation of local groups** to support their position and capacity against other actor categories. Furthermore, they may help to establish and support local NGOs, build partnerships, share information and promote learning from experience. To be able to realise these tasks, NGOs need to **tailor their projects according to local abilities and time-scales**, coordinate them among each other and with scientists, the park authority, and administration on different levels.

Concrete challenges for NGOs are seen in **investigations into alternative sources of energy** and making them available for local people. This could include forestation along rivers, the promotion of small hydro power techniques in the Western Pamirs and the inquiry into solar or wind power stations in the Eastern Pamirs. Other activities should focus on the **production of new products** that may be sold on local markets, such as the processing of food and the construction of agricultural tools.

On a larger scale, international organisations should strictly **control the compliance with environmental legislation** and serve as a backstop for the TNP authority and the administration. International organisations should **act as consultants** and provide their experience to national actors.

12.2.6 Tour operators

It is important that tour operators that take resources out of the Pamirs, via people from the lowlands or foreigners, **adequately pay for these resources**. Tour operators, especially trophy hunting companies, should **provide opportunities for local people to take part in this business**. They should employ local people or provide them with compensation for reductions in or negative effects on their activities (e.g. provide herders with hay if they agree to reduce the use of pastures in favour of Marco Polo sheep).

Tour operators should try to **market local products and cultures with the history and ecology of the Pamirs in mind**. Activities that are not compatible with this should not be promoted (e.g. heli-skiing). Furthermore, tour operators have to **invest in the establishment and maintenance of local infrastructure** on which they are strongly dependent. Tour operators with healthy budgets should investigate in the use of alternative sources of energy and thus demonstrate a positive example for other actors.

It is necessary for all foreign hunting-tour operators to become active in conservation and take responsibility for those resources they use most, e.g. Marco Polo sheep. It is unacceptable to delegate this task to local Nature Protection Committees, to the government or the TNP. With respect to the delicate situation of the Marco Polo sheep population and the effects of international hunting on the local population, hunting operators are asked to **investigate more sustainable forms of resource use**. Possible are organised wildlife watching, trace tracking in the snow or other tours where eco-tourists can learn about and experience the nature

of the Pamirs. Hunting companies should **exchange their knowledge about wildlife distribution** with the park authority. Furthermore, employees of hunting companies which are very experienced should **support the TNP authority to organise training for park staff** with respect to census and survey techniques.

12.2.7 Tourists

Foreign tourists should not be put off visiting the TNP by the inconvenient setting of the area and should not expect to be served as in the West. They should **be aware of the cultural values** of the whole area and of specific resources, particularly Marco Polo sheep. Furthermore, tourists should be aware of the local prices and the **delicate effects of money market businesses** in a society not used to bargaining with money.

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Appendices

Appendix A

Interview guideline

General information

- Name, contact address
- Job, duties and responsibilities
- Experiences
- Maps and other documents available?

Notes

- ⇒ Differ between hypothetical questions and questions concerning concrete events!
- ⇒ Pay attention to perspectives specific to gender and culture!
- ⇒ State and dynamics; conditions, potentials and constraints. Alternatives?

Park system planning

New area studies and criteria:

- Criteria for national significance of natural, cultural and recreational resources?
- Suitability and feasibility: when is an area considered suitable for addition to a national park and what are the features that make an area feasible as a new national park?
- Authorisation: who decides if a new area should be authorised as a protection unit? Suggestions about what uses should be permitted, prohibited or allowed?
- Legal base: level of legal orders (international - national - regional - local)?

Park planning process and products:

- Goals and objectives of the TNP
- Statement for management: existing conditions, management objectives that describe the conditions that need to be achieved to realise the park's purpose. Knowledge about international management concepts of protected areas?
- Outline of planning requirements: plans and tasks needed to address issues, gather information, achieve objectives?
- Information base: updated information about natural and cultural resources, regional demographic, ethnographic, and socio-economic data relevant to planning and management as a base for formulating proposals, evaluating alternatives, making decisions during planning?
- Public participation in planning: when and on which level the public is involved in the planning process? How is the public organised to influence the national park (individuals, interest groups, NGO's)? Public relations?
- General management plan: management concept and category, existing plans for conservation, recreation, transport, economic development, strategies for solving issues and achieving management objectives? Spatial framework of the management plan, planning priorities? Staff, people included into the planning team? Cooperation, scopes, task sharing? Categories of management zones? Bases for the delin-

eation of management zones? Proposals for resource protection and management, co-operation with associated local interests, visitor use with general indications of location, size, capacity and function of physical developments? Implementation schedule, cost estimates, funding?

- Boundary studies: demarcation of the park boundaries? Studies of potential boundary adjustment and recommend boundary revisions to include significant resources related to the purpose of the park; to address operational and management issues such as access and boundary identification by topographic or other natural features or roads; to protect park resources critical to fulfilling the park's purposes?
- Implementation plans: existing implementation plans, consistent with the general management plan? Latest activities and projects?

Park planning in a regional context:

- Impacts from outside the park: activities on adjacent lands that may significantly affect the success of park programs?
- Impacts of the park: effects of the activities of the TNP outside its boundaries?
- Cooperation: information of the public about the park, cooperative regional planning, exchange of interests, technical assistance? Cooperation with other protected areas, economic development?
- Land use: land use inside and outside the TNP and its possible influence on the park management objectives?

Landscape ecosystems

Bio-physical units:

- Grassland: location, characteristics, land cover? Important elements of flora, endemic species, areas of high diversity, composition on pastures in use or out of use, salination, degradation? Altitudinal distribution?
- Forest: location, characteristics, land cover, altitudinal distribution?
- Cultivated land: location, characteristics, land cover?
- Rivers, lakes: location, characteristics, land cover?
- Barren land: location, characteristics, land cover?

Cultural units:

- Administrative units
- Patterns of utilisation: TNP and other protected areas, hunting areas, etc.

Land ownership

- Land ownership inside and outside the TNP?
- Land management: co-operative approaches such as agreements, regulations, zoning?

Use of resources within the TNP

Fees and regulations:

- Park fees: organisation, sum, use of income?
- Permissions: Activities that are allowed, prohibited (temporally, spatially)?

Specific resource uses:

- Mineral development: regulation of mineral exploration, extraction and production?
- Agricultural uses: location of agricultural activities inside the TNP, organisation of agricultural land use, management, cooperation, tools? Use of fertilizer, intensity

of use, soil quality, degradation, irrigation? Traditional use, agricultural calendar, products, quantity and quality, markets, preservation techniques?

- Pasture use: location of pastures, characteristics, quantity and quality, vegetation cover, temporal use, stocking rates, degradation, salination? Animals, numbers, quality, diseases, fodder? Products, preservation techniques, markets? Pasture and livestock management inside and outside the TNP? Access to pastures? Protecting measures?

- Use of wildlife resources: species hunted, numbers, legal and illegal activities, licences, organisation, control? Sources and actuality of information (census data), frequency of hunting trips, experiences of trophy hunters, knowledge about Marco Polo sheep population and numbers? Interests in conservation? Income generation, bribery, sanctions? Future of trophy hunting companies located inside the TNP? Management of wildlife by hunting companies, hunting areas, relationship with local people?

- Collecting of natural products: Natural products collected and processed, location of collection, permissions, management, awareness, protection. Use of fish, wildlife resources, forest products, medical herbs, *teresken* and *shivaq*? Subsistence uses?

- Water use: use of water, irrigation, regulation and management, water channels? Mini-hydropower stations, dams and reservoirs (natural and artificial) inside the TNP, impact on the environment?

Natural resource management

General:

- State of resources: intensity of use, degradation, goal of protection?
- Basic management concepts: natural zones, cultural zones, park development zones?
- Science and research: scientific basis for planning, development and management decisions? Applied research necessary to direct management actions in pursuit of the park objectives? Relationship to planning and management? TNP used for scientific studies, equipment for research inside the park? Publication and availability of scientific results?
- Inventory and monitoring: existing inventories, updates, use for the park?
- Co-operation with others: co-operation with other land managers to accomplish ecosystem-stability?

Water resource management:

- Protection of surface and ground water: Water quantity and quality? Groundwater flows and water points? Consumption of water inside the park? Management of water use? Erosion due to water? Pollution of water? Salination? Location of floodplains and wetlands, inventories, location of high hazard flood areas?
- Water rights: Organisation and management of water use?

Biological resource management:

- Animals: Activities focusing on species and habitat protection and management? Population management? Management of harvested species, organisation of hunting, control of activities, feeding? Management of predators? Management of migratory animals and fishing?
- Landscapes and plants: modification of natural zone? Management of cultural zones? Park development zone?
- Genetic resources: Protection of all genetic resources as a main goal of the park management?
- Restoration of native plants and animals: reintroduction of native species after extinction? Collection of species for ex-situ conservation?

- Threaten or endangered plants and animals: identified species, inclusion in RDB? Critical habitats of these species? Activities to protect these species? Availability of maps?
- Exotic plants and animals: non-native, exotic species?
- Pests: native or exotic pests in the park, species?

Management of other natural resources:

- Fire management: fires inside the park? Reasons?
- Air resource management: air quality, air pollution impacts? Weather and climate, climatic changes, impact on the environment?
- Geologic resource management: Protection of geologic features, monitoring of caves, arches and hot springs? Soil resource management, erosion and degradation, soil map of the park area?
- Wilderness management: areas preserved as wilderness areas, location? Definition of wilderness, use of wilderness? Monitoring of wilderness areas?

Cultural resource management

Resource identification, evaluation, and registration:

- Inventories: Cultural resources identified and evaluated as required parts of the park's information base? Existing, needed cultural resource inventories?
- Evaluation and categorisation?

Consultation:

Informal exchange of views with concerned local communities on cultural resource matters?

Cultural landscapes and structures:

Use of historic structures, structures owned or managed by others, damaged structures, ruins, etc.?

Treatment of cultural resources:

- Outsiders: Knowledge about and acceptance of other cultures?
- Insiders: Handling of traditions, traditional knowledge. Identification with lifestyle, household strategies. Social organisation, gender?
- Museum objects and library materials?
- Preservation, rehabilitation, restoration and reconstruction? Awareness of locals concerning conservation measures?

Burial sites and cemeteries:

Significance of *mazars*? Burial sites inside the TNP? Actual use?

Interpretation and education

Interpretive programs:

- Information and orientation: understanding, participation, capacity building, dialogue, education, inclusion of traditional knowledge?
- Formal and informal lines of communication
- Co-operating associations: exchange with and support of volunteers, NGOs and other national and international organisations?

Interpretive services:

- Personal services: trainings, visitor education?

- Nonpersonal services and media: park publications, exhibits, radio information system?

Research:

- Disciplines: projects, findings, interdisciplinary studies?
- Equipment: research stations, equipment, budget?
- Cooperation: cooperation with the TNP, access to data, publication of data, libraries, museum, education, support, scope, influence?

Park facilities

General:

- Facility planning: facilities existing within the TNP, location, needs for new facilities?
- Maintenance: organisation of maintenance, opportunities for local people?
- Utilities: use of park facilities by local people? Can local people provide some facilities, where? Use of old Soviet facilities within the park?
- Waste: removal of waste around hunting camps and tourist facilities?
- Energy: Organisation of energy supply? Possible effects of tourist facilities on local energy situation?

Access and circulation systems:

- Access regulations: periodically hindered access, access rights to high pastures and water?
- Road system: planned and constructed roads inside the TNP, location, use, state, maintenance?
- Trails and walks: special trails, use of existing trails?

Visitor facilities:

- Visitor centre, hotels, food service, campgrounds, access, use regulations?

Management facilities:

- Location inside and outside the TNP, offices, facilities for employees, use of historic structures?

Acceptance of the TNP

Perceptions

- Awareness of the TNP: knowledge about the TNP, source of information? Understanding of and experiences with protected areas? Awareness concerning nature conservation and management of natural resources, delegation to the state institutions, long time perspectives, importance of nature conservation, activities, conditions needed to become active in conservation?
- Objectives: objectives within and outside the TNP? Interests in the TNP?

Conflicts

Fears, rivalries, constraints, prejudices?

Appendix B

Categories of text analysis

B.1 System of categories

First category	Second category	Third category
TNP	Goals Origin Actual state Organisation Relevance	Elements Nature conservation Pamir Mountains
Natural environment	Resources Localisation, habitat Dynamics	Single elements Interaction between elements Inside the TNP Outside the TNP Habitat Species
Actors	Occupancy of the landscape Visions Values, norms Attribution	Needs Options Constraints Self-attribution External attribution
Interaction	Resource use Conflicts Timeframe	Vegetation Wildlife Herding Agriculture Fuel Conservation Tourism involved actor categories Reasons, processes

B.2 Codes

biodiversity		Interaction	local-foreigner
biomass index			locals-NP
constraints			locals-officials
crop	organisation		wildlife-livestock
	harvest		wildlife-men
	species	<i>jailoo</i>	life, seasons
culture	general		location
	handicrafts		past and today
	mazars, legends	job, profession	
	medicine	knowledge	
	trade	land use	dynamics
degradation	overuse		organisation
	salinisation	livestock	numbers, dynamics
development projects			critical month
ecotourism	conditions		fodder
	labelling		management
	objectives		numbers past
	organisation		owner
education, training			spreading
energy	general	mapping, maps	
	high pastures	mountain environments	
	winter place	natural hazards	
environment		nature protection	soviet time
expeditions			today
fertilizer		needs	
fish		options	
future (general)		parentage, relationship	
<i>gozchose</i>	organisation	pastures	management
	past		changes
	state and future		choice of
herders	numbers		state
	organisation		summer
hunting	acceptance		use
	area		winter
	finances	poaching	awareness
	hunters life		dynamics
	information		poacher
	licences		state
	organisation	problems	former
	permissions		today
illegal deals		RDB	
infrastructure		research, sciences	

salaries, prices	
syndrome	
<i>teresken</i>	awareness
	dynamics
	location (collection)
TNP	(source of) information
	aim
	border line
	constraints
	cooperation
	finances
	organisation
	staff
	suggestions
	zones
	value and relevance
tourism	
tourists	
trails, transport	
vegetable gardens	
vegetation	use
	hay making
	hay use
	plant species
	quality and quantity
visions	
water	
wealth ranking	
weather, climate	
wildlife	awareness
	existing
	habitat
	protection
	use
	value
wildlife MP	awareness
	census
	dynamics
	habitat
	impression
	migration
	numbers
	protection
	reasons for changes

Appendix C

Mapping index

Based on mapping index worked out for the PSP / CAMP field campaign 2001.

Line elements:

Border, boundary:	National border	
	<i>Oblast</i> border	
	District border	
	Community border	
	Property border	
	National Park	
Mobility:	Road	
	Trail	
	Path	
	High pasture route	
Water element:	River:	<i>Perennial</i>
		<i>Temporary</i>
	Brook:	<i>Perennial</i>
		<i>Temporary</i>
	Irrigated channel:	<i>Used</i>
		<i>Not used</i>

Point elements:

Yurt
Building
Bridge
Pass
Cultural facility
Watering place
Other elements

Spatial units:

Vegetation:	Culture:	<i>Cropland</i>	
		<i>Pasture (spring, summer, autumn, winter)</i>	
		<i>Meadow</i>	
		<i>Follow field</i>	
		<i>Horticulture</i>	
		<i>Fruit-growing</i>	
		Forest	
		Village trees	
		Alpine vegetation	
		Bush land	
Barren land:	Degradation:	<i>Water erosion</i>	
		<i>Fertility decline</i>	
		<i>Wind erosion</i>	
		<i>other</i>	
			Rock, stone cover
		Bare soil	
		Glacier, snow	
		Water surface:	<i>Lake</i>
			<i>Reservoir</i>
			<i>Salt lake</i>
Settlement:	Village		
	Temporary settlement		
	Mobile settlement		

Appendix D

Different borderlines of the TNP from 1992 to 2003

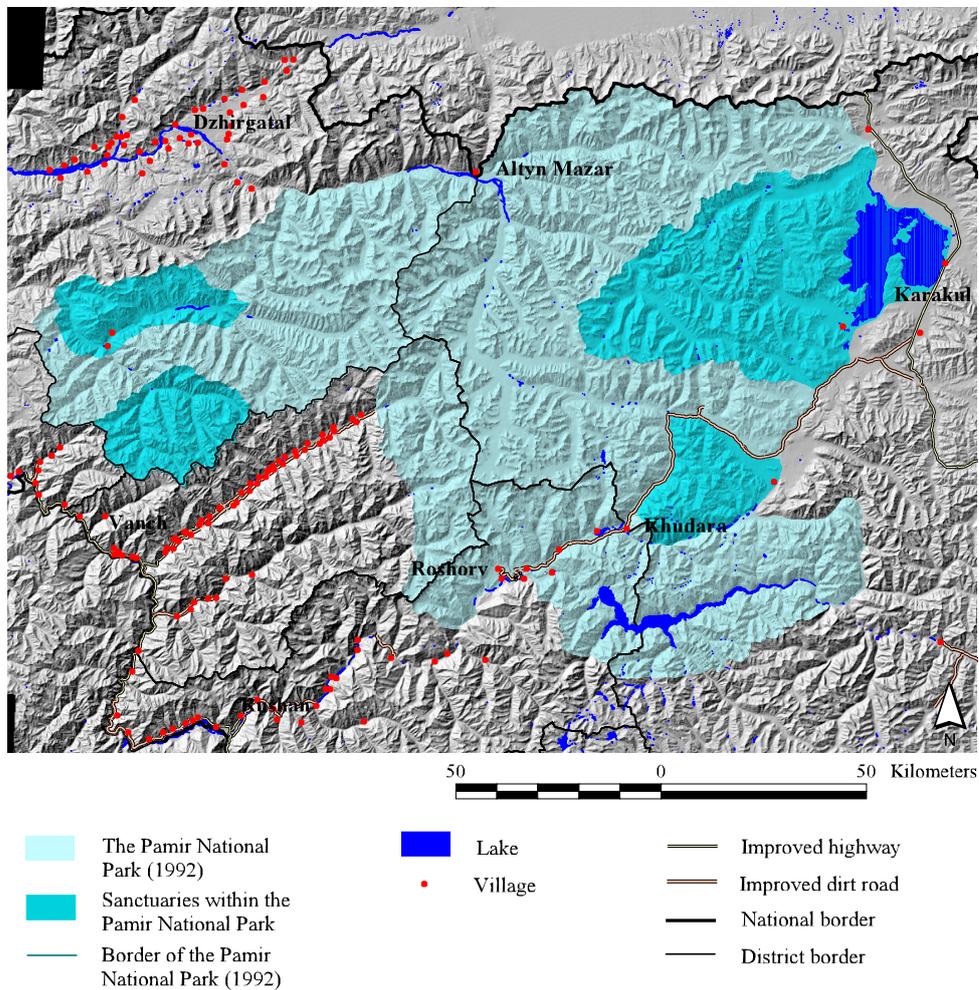


Figure D.1: The Pamir National Park (PNP) in 1992, covering an area of 20,906 km² (Data source: DTM derived from Russian topographic map series 1:200,000 by CDE; Pamir National Park according to Badenkov and Buzurukov, 1993).

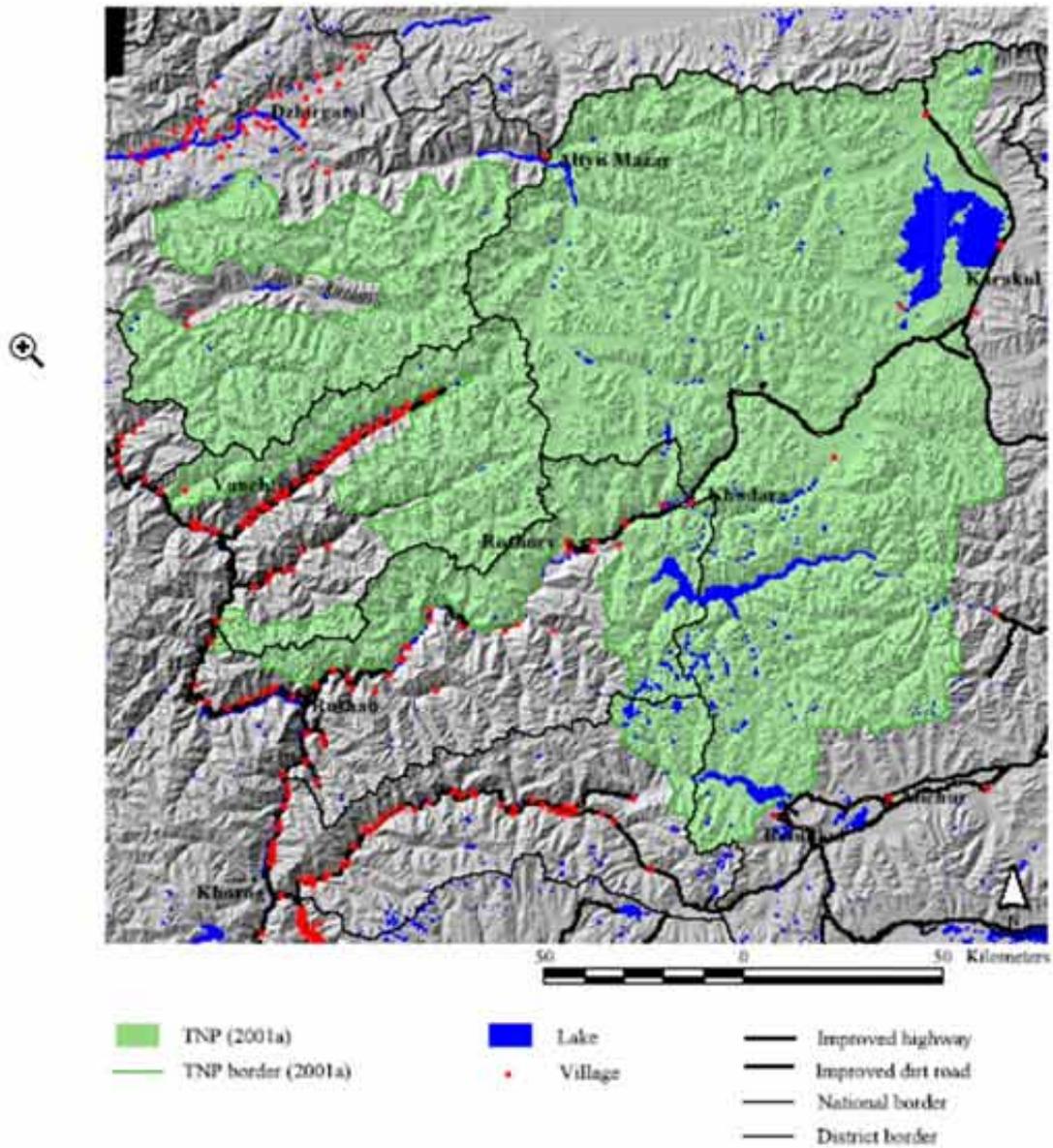


Figure D.2: The TNP in 2001 (a), covering an area of 25,883 km² (Data source: DTM derived from Russian topographic map series 1:200,000 by CDE; TNP according to Kasirov et al., 2001).

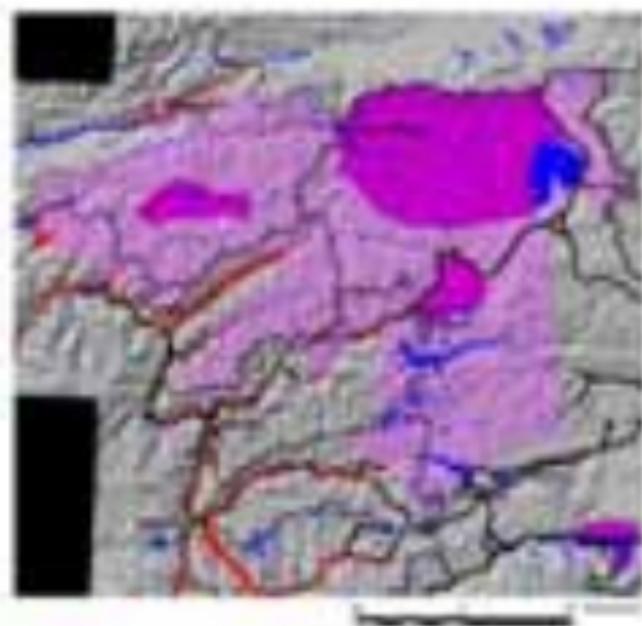


Figure 1. (A) TTR in 2000. (B) urban area in 2000 (red) and TTR in 2000 (green). (C) urban area in 2000 (red) and TTR in 2000 (green). (D) urban area in 2000 (red) and TTR in 2000 (green).

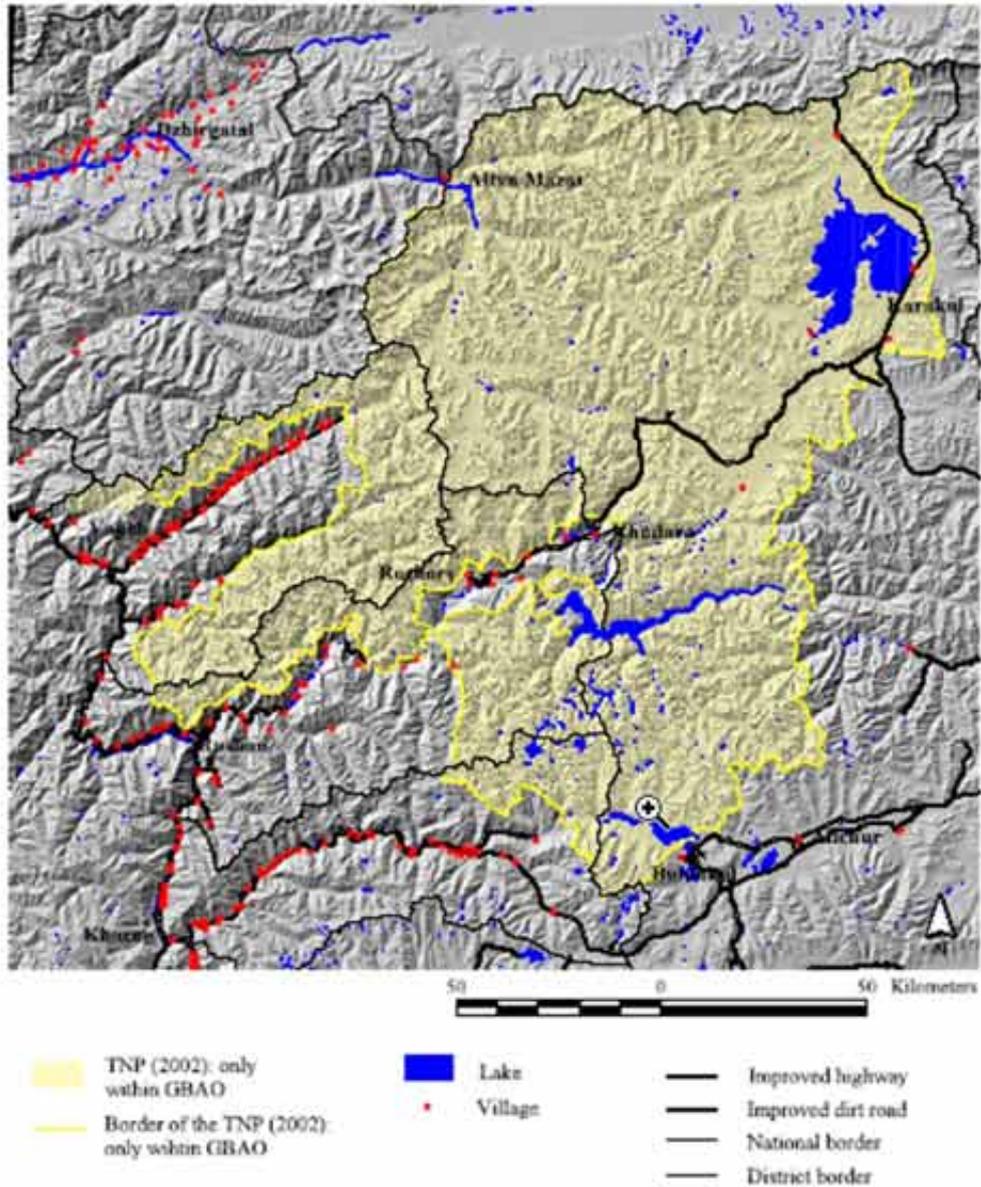


Figure D.4: The TNP within the GBAO in 2002, covering an area of 20,576 km² (Data source: DTM derived from Russian topographic map series 1:200,000 by CDE; TNP according to TNP, 2002).

Appendix E

Laws, Codes, Resolutions, and Governmental Decisions related to nature conservation, resource management and the TNP

The listing bases on information from NABU (2002), WWF (2002) and Novikov and Safarov (2003e).

Laws, Codes and Resolutions:

- Nature Conservation Act, 1993
This serves as basis for nature conservation in Tajikistan. It determines the organisational framework for the establishment and strengthening of environmental protection. The law authorises the collection of fees, taxes, and fines related to natural resources and environmental degradation. In addition, it provides the legal basis for the provision of training in environmental protection measures. Other provisions in the law include the conservation of soil as biologically alive media, the protection of air quality, the protection of the quality and quantity of water, the protection of biodiversity, and the protection of environmental balance and monitoring.
- Resolution on the unauthorised collection of organic material, 1990
- Law on land charges, 1992
- Resolution on the Ministry of Environmental Protection, 1992
- Water code, 1993
- Regulations on forest management, 1993
- Law on conservation and use of wildlife, 1994
- Law on nature protection, 1994
- Resolution on state ecological review, 1994
- Law on mineral resources, 1994
- Forest code, 1996
- Law on air protection, 1996
- Law on protected areas, 1996

- Land code, 1996
- Resolution on state ecological programme, 1997
- Regulations on hunting and game reserves, 1997
- Nature protection act, 1998
- Water code, 2000
- Law on plant quarantine, 2001
- Regulation on the procedure of approval, preparation, and issue of licences for the use of fauna, 2001
- Law on energy saving, 2002
- Law on ecological expertise, 2003

State Programmes:

- Programme of development of GBAO for 1995 and for the period until 2005, 1993
This document include a number of concrete measures on the implementation of ecological conditions in GBAO, in particular the organisation of the Tajik National Park as well as tourism development.
- Decision about the state programme of ecological education and training of the population of the Republic of Tajikistan until 2000 and for the period until 2010 and measures on realisation of this state programme, 1996
- Decision about the statement of the state ecological programme of Republic of Tajikistan for the period 1998-2008, 1997
- Decision about measures on the performance of the state ecological programme of the Republic of Tajikistan, 1998
- Decision about the approval of the complex plan of the basic measures on ecological migration for 1999, 1999
- Decision about the approval of the National plan of activity on the environment hygiene in the Republic of Tajikistan, 2000
- Decision about land allotment for the Tajik National Park, 2001

International agreements:

- UN Convention on Biological Diversity (CBD), 1997
- UN Convention to Combat Desertification (CCD), 1997
- Ramsar Convention on Wetlands (Ramsar), 2000
- Convention on the Conservation of Migratory Species of Wild Animals (CMS), 2000
- Aarhus Convention on Access to Information, Public Participation in Decision-Making Processes, and Justice in Environmental Matters (Arrhus Convention UNECE), 2001

Appendix F

International categories and management objectives of protected areas

Categories I to VI are specified by IUCN et al. (1994) the additional ones are added by IUCN et al. (1991, p. 192–193).

Category Ia - Strict Nature Reserve:

Protected area managed mainly for science. Area of land and/or sea possessing some outstanding or representative ecosystems, geological or physiological features and/or species, available primarily for scientific research and/or environmental monitoring.

Category Ib - Wilderness Area:

Protected area managed mainly for wilderness protection. Large area of unmodified or slightly modified land, and/or sea, retaining its natural character and influence, without permanent or significant habitation, which is protected and managed so as to preserve its natural condition.

Category II - National Park:

Protected area managed mainly for ecosystem protection and recreation. Natural area of land and/or sea, designated to (a) protect the ecological integrity of one or more ecosystems for present and future generations, (b) exclude exploitation or occupation inimical to the purposes of designation of the area and (c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible.

Category III - Natural Monument:

Protected area managed mainly for conservation of specific natural features. Area containing one, or more, specific natural or natural/cultural feature which is of outstanding or unique value because of its inherent rarity, representative or aesthetic qualities or cultural significance.

Category IV - Habitat/Species Management Area:

Protected area managed mainly for conservation through management intervention. Area of land and/or sea subject to active intervention for management purposes so as to ensure the maintenance of habitats and/or to meet the requirements of specific species.

Category V - Protected Landscape/Seascape:

Protected area managed mainly for landscape/seascape conservation and recreation. Area of land, with coast and sea as appro-

priate, where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, ecological and/or cultural value, and often with high biological diversity. Safeguarding the integrity of this traditional interaction is vital to the protection, maintenance and evolution of such an area.

Category VI - Managed Resource Protected Area:

Protected area managed mainly for the sustainable use of natural ecosystems. Area containing predominantly unmodified natural systems, managed to ensure long term protection and maintenance of biological diversity, while providing at the same time a sustainable flow of natural products and services to meet community needs.

Two additional protected areas are international labels which overlay protected areas in the above eight categories:

Biosphere Reserve:

To conserve for present and future use the diversity and integrity of biotic communities of plants and animals within natural ecosystems, and to safeguard the genetic diversity of species on which their continuing evolution depends.

World Heritage Site:

To protect the natural features for which the area is considered to be of outstanding universal significance. This is a select list of the world's unique natural and cultural sites nominated by countries that are Party to the World Heritage Convention.

Appendix G

Notes on the methods

The following notes are intended to briefly illustrate the problems, strengths and weaknesses of the methods used in this thesis and thus to help other people carrying out scientific investigations in this field.

The framework of the SDA was very helpful for the arrangement and structure of the work. It is clear that the huge coverage of this approach can only be conducted within teams composed of several people. As a consequence, this instrument could not be fully implemented during the field work in 2002. However, thanks to participation in the international Strategy Workshop for Sustainable Development of the Tajik Pamirs in October 2002, constituting the latest element of the SDA, important experience could be gained in reapply results of earlier scientific investigations (done in 2001) to the field. The exchange of information with other people concerned by these studies was highly interesting. The reactions and feedback given by these people to the presented analysis was very helpful to the further proceeding of own work on this thesis.

The choice of the study sites was a critical step in the beginning of the field period. To select sites that are important for the research questions it is necessary to have a basic knowledge about the whole area. Since my experience from 2001 only covered the Eastern Pamirs and the base for field work (2002) was set in Murgab, the western part of the park, particularly the areas outside the GBAO, could not be taken into account. It is thus not clear, if a different selection of study sites would have led to a different overview of the use of resources and other objectives of the people concerned. However, during the analysis the selection of the study sites was rated as representative of the GBAO. The location of the park required high investment in organisational and logistical aspects during the field period. A good relationship with the KGB and other institutions was necessary to get the needed permissions, organise the fuel and find a credible driver. Facing these organisational aspects and the fact that travelling within the park is very time consuming, the duration of the field period was rather short. Furthermore, the analysis of various types of resource use could have been done better during another season (energy use and trophy hunting: late winter). In winter, however, the access to the area would have been more difficult. During the field period in summer, parts of the area were hardly reachable due to swollen rivers (melt water and thus high discharge, particularly at noon).

The selection of interviewees was done in a continual process during the field period. As a student and particularly as a woman coming from a Western country, it was often hard to achieve a candid and cooperative atmosphere during the interviews, particularly with representatives of the administration. Gender aspects also had an effect on the interview situation. Most interviewees were male and especially the discussion of delicate topics such as hunting, or poaching, was difficult.

Linguistic barriers were frequent. First of all it was not possible to find an interpreter with sufficient experience in Murgab itself. External interpreters were not

familiar with the local circumstances and could thus not provide background information necessary for organisational aspects. During the interviews themselves only few linguistic problems arose. They mainly concerned difficulties with the translation and circumscription of western terms and concepts, such as 'biodiversity' and 'sustainability', into Russian or Kyrgyz. Particularly during the stays on the high pastures it was noted that important information was mainly given outside the official interview. Not all of these inputs could be translated and noted or be classified within the prepared scheme of the interview guideline. However, they served as important background information and helped to extend cultural understanding. Sometimes the presence of several people led to a complex situation and meant that only the most active persons communicated their interests during an interview. During group discussions people often discussed their ideas among themselves without really communicating them to me. This was always a difficult situation for the interpreter and proved to be unsuitable for data generation. Good information was mostly received during participatory walks in the field. However, it turned out that the given information, particularly about vegetation and history, varied much between the areas. Local names for plants for example changed with every valley. One type of question turned out to be inconvenient for this region: questions beginning with 'what would be if...' were hardly ever answered. This may be explained by the fact that resident people have to deal so intensely with the present challenges that they may not invest their time and energy in pondering questions dealing with something virtual. People were often only able to give their opinion about facts, which made it difficult to ask questions about visions concerning the TNP. The method of noting the interviews into a field book was time consuming but proved to be practical, especially during later analysis.

Workshops were assessed as an important instrument in getting local information. However, they were difficult to organise, since the mobility of the people was limited and infrastructure was missing. However, the workshop held on Sustainable Management of Wildlife Resources in the Eastern Pamirs in September 2001 provided a lot of information and particularly constituted an example of how to bring together members of different actor categories and exchange information and ideas among them.

Mapping was only possible to give rough overviews of pasture areas since the formation of the habitats and the patterns of resource use are intensely varying on an extremely small scale. *Teresken* is not evenly distributed within a certain area and collected according to various aspects (access, supply with alternative sources of energy, number of livestock and households, etc.); it could thus not be mapped. It was amazing to see that most people in the field could easily read the maps.

The handling of requirements and priorities mentioned by the interviewees that contradict my own ideals was difficult. While compiling the interests of different actor categories I exposed myself to the rivalries between them, at the same time I tried to contribute to an exchange of information and ideas among the various actors. This was a balancing act I could only follow by assuming the position of an outsider. It was not always easy to keep the same distance to all actor categories. Therefore it is worth mentioning that, although the thesis was written with the best of intentions, any shortcomings or contortions of the facts are entirely my responsibility.