

The Tajik Pamirs

Challenges of Sustainable Development
in an Isolated Mountain Region





The Pamir Strategy Project was one of the major activities of the Swiss Agency for Development and Cooperation's special programme for the International Year of Mountains, IYM 2002.

This publication is based on the outcomes of the Pamir Strategy Project (PSP), which was implemented by CDE on behalf of the Swiss Agency for Development and Cooperation (SDC)

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Berne, August 2003

Hans Hurni
Thomas Breu

Preface

Central Asia is a region with a unique mountain landscape that has traditionally been a crossroads of civilisations, shaped over the centuries by many different cultures, empires and political systems. Moreover, it is a region of major geostrategic importance. Following the break-up of the Soviet Union, Central Asia became a focus of international attention. Central Asian countries face the challenge of finding a political identity and creating a national economy. The ongoing transition to a market economy and the changes taking place in political systems have been accompanied by increasing poverty, growing social disparities, and declining public services. Only in recent years have positive trends begun to emerge.

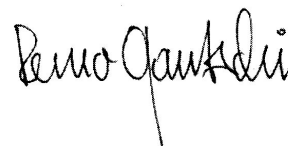
The stunningly beautiful mountainous areas of Central Asia and their inhabitants have been particularly affected by this transition. This is especially true for the Pamir Mountains. Subsidies provided by the central government for decades suddenly ceased, markets disappeared, and infrastructure deteriorated. At the same time, new economic alternatives failed to emerge. Consequently, people living in the Pamir Mountains have suffered a decline in living conditions, while fragile mountain environments have deteriorated and out-migration has become common throughout Central Asia.

Switzerland represents Kyrgyzstan, Tajikistan, Uzbekistan and Turkmenistan in the Bretton Woods Institutions (World Bank, International Monetary Fund); but its interest in these countries goes beyond this diplomatic function. A Swiss regional programme in Central Asia, as well as bilateral initiatives, have resulted in implementation of concrete programmes and projects in different parts of these countries since 1993. Switzerland is also represented in the region through the activities of its global mountain programme and its special support for the International Year of Mountains (IYM2002).

The Swiss Agency for Development and Cooperation (SDC) initiated the Pamir Strategy Project (PSP) as part of its programme for IYM2002, with the hope that it would prove an attractive and far-reaching component of that programme. The aim of the PSP was to define strategies for dealing with the challenges faced by the populations of mountain areas in transition. As a pilot project, it is expected to help improve living conditions in the Tajik Pamir and serve as a model of methodological approaches that can be applied in other mountain areas as well.

The present publication is an attempt to present some of the various results of this project. It portrays life in the Pamirs and addresses development challenges and options, along with insights and awareness related to the potentials and difficulties of mountain regions in general. From SDC's perspective, the purpose of this book is not only to survey the status of a particular mountain region, but also to contribute to discussions of practical and participatory approaches that can lead to sustainable mountain development.

It is our hope that this publication, along with the other outputs of the project, will make a valuable contribution to sustainable mountain development in the Pamirs and to similar successful endeavours in other mountain regions.



Remo Gautschi
Deputy Director-General
Swiss Agency for Development and
Cooperation

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part I

History and
environment



Engels Peak and Marx Peak in the Tajik Pamirs. The transition of this high mountain area to a market economy poses a great challenge in political, social, ecological and economic terms. (Photo: M. Hauser)



Background, aims and methodology

The Pamir Mountains in Tajikistan are an extremely isolated high-mountain region. However, the region's geographical location at the crossroads between China to the east, Pakistan to the south, Afghanistan to the west, and Kyrgyzstan to the north offers a unique opportunity for economic, social and ecological development. Numerous peaks with altitudes ranging from 5000 to almost 7500 m deliver their waters to the basin of the Pandzh-Amu Darya River, thereby making rich agricultural production possible further downstream in the semi-arid lowlands. Although only thinly populated, the deep valleys of the Pamirs are home to several ethnic groups that practice irrigation agriculture, while the highland meadows in the Eastern Pamirs are used mainly for livestock raising.

Despite apparently widespread poverty and livelihoods that focus on survival rather than economic development, the Pamir region also has obvious potentials that have only been partially tapped to date. Among the region's important assets are rich natural resources (e.g. with the potential for hydropower generation), scenic beauty that could attract tourists, and a comparatively high educational standard based on the unifying vision of the Ismaili culture of Shia Islam in extensive parts of the Gorno Badakhshan Autonomous Oblast (GBAO).

The collapse of the Soviet Union in 1991 brought independence to Tajikistan as well as to all the other republics of Central Asia. The subsequent transition from a planned economy to a market economy has led to profound changes in these countries. Marginal mountain areas such as the Pamirs have been particularly affected by the process of political and economic transformation. Currently, the economic situation in the Tajik Pamirs is characterised by persistent poverty and a high level of dependence on external humanitarian support. When Tajikistan was part of the Soviet Union, Gorno Badakhshan received considerable subsidies for energy, food, and infrastructure. When it became independent, however, these subsidies were terminated. The impact of this abrupt cessation of economic support was aggravated by the civil war that broke out in other regions of Tajikistan in 1992, which brought a wave of refugees to Gorno Badakhshan.

The threat of famine was averted only with the help of continuous and massive external relief efforts by the agencies of the Aga Khan Development Network (AKDN), which continue to this day.

Promoting sustainable development in the Pamirs is a great challenge from the political, economic, social and ecological points of view. Encouraged by the various efforts of the population of the Pamir Mountains, which had long been supported by the AKDN and other organisations, the Swiss Agency for Development and Cooperation (SDC) agreed to fund preparations for a strategy of sustainable development in the Tajik Pamirs as a model for sustainable development in mountain areas.

In 2001 the Centre for Development and Environment (CDE) of the University of Berne, Switzerland, was asked to implement a two-year project that was part of SDC's programme for the International Year of Mountains (IYM2002). The aims of the so-called 'Pamir Strategy Project' (PSP) are listed in the box to the right, while the general approach and elements of PSP are shown in the graph.

As a prerequisite for the elaboration of a sound development strategy, it was considered necessary to generate a knowledge system providing information on the current state, trends and mechanisms of social and ecological systems.

To accumulate the necessary knowledge, different field studies and surveys involving more than 25 local and foreign experts were carried out in the GBAO in the summer of 2001 and part of 2002. In cooperation with agencies of the Aga Khan Development Network and the Agency for Technical Cooperation and Development (ACTED), baseline information was gathered for 10 strategic sectors of the Gorno Badakhshan Autonomous Oblast.

Local conditions and processes were appraised to gain an in-depth impression of livelihoods and resource management. Selected villages in the GBAO were evaluated by carrying out participatory fieldwork and studying household and community strategies. The focal points of these studies were coping strategies and the perceptions and visions of villagers and herders.



The ultimate goal of mountain development is to improve the living conditions of the local population...
(Photo: J. Schneider)



...and to balance economic needs with the need to conserve natural resources in a fragile mountain environment.
(Photo: P. Sieber)

To complement this system of information, remotely sensed data, along with data on natural resources and socio-economic data, were incorporated in a Geographic Information System (GIS). Upon completion, this system was turned over to the local authorities and the project's partner organizations, accompanied by introductory training. It is expected that this comprehensive and versatile spatial information and knowledge system will contribute to sound planning and ultimately provide better information for decision-making, both at the administrative level and within cooperation agencies working in the region.

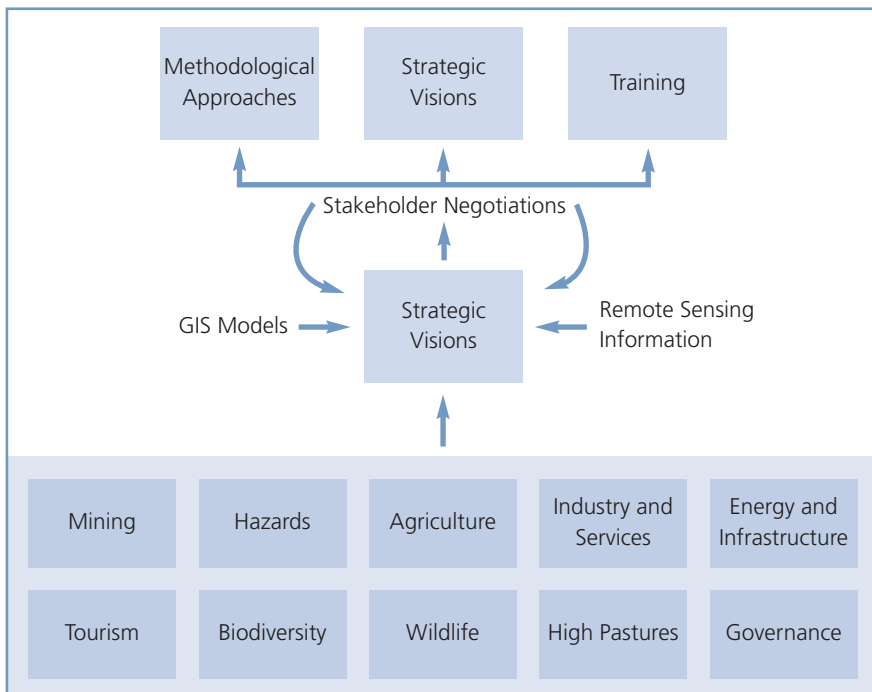
The culminating point of the Pamir Strategy Project was the presentation and discussion of project results in a multi-level stakeholder workshop (stakeholder negotiations), held in Khorog in October 2002.

This workshop ensured the active involvement and broad participation of stakeholder groups from community to international level and resulted, among other things, in a list of prioritised strategic elements geared towards a strategic vision.

Aside from concrete outputs enhancing sustainable development in the Pamir Mountains, the experience gained in this project is expected to contribute to the design of other programmes concerned with strategy development and baseline surveys. The Pamir Strategy Project will be evaluated for this purpose, with the intent of providing exemplary methodological approaches for the planning and implementation of development projects and initiatives in transition countries of the former Soviet Union, as well as in other mountain areas of the world.

The Pamir Strategy Project (PSP)

In cooperation with agencies from the Aga Khan Development Network (AKDN), the Agency for Technical Cooperation and Development (ACTED) and local authorities, the Pamir Strategy Project focused on preparation of a development strategy for the Tajik Pamir Mountains. For this purpose, a database including a Geographic Information System was prepared, which combines data on the status and dynamics of various sectors, and information from participatory studies at village level. On the basis of this knowledge, a strategic vision for the region was negotiated with all concerned stakeholder groups in a workshop in the Gorno Badakhshan Autonomous Oblast (GBAO) in October 2002. Besides concrete results, the project provided conceptual and methodological approaches to sustainable development that can be applied in other mountainous areas. The Pamir Strategy Project was implemented by the Centre for Development and Environment (CDE), University of Berne, with funding from the Swiss Agency for Development and Cooperation (SDC), and was a special activity of the International Year of Mountains 2002 (IYM 2002).



Elements of the Pamir Strategy Project (PSP)



The Pamir Mountains, particularly the Western Pamirs, are the water towers of Central Asia. Rainfall, which increases greatly with altitude, is stored in glaciers that provide water to the adjacent lowlands during the dry summer season. (Photo: J. Schneider)

Extreme environmental conditions in a breathtaking landscape

Thomas Breu and Hans Hurni

The Pamir Mountains, or Pamirs, also known as the Roof of the World, extend across parts of Afghanistan, China, Kyrgyzstan, Pakistan and Tajikistan. The heart of the Pamirs is located in Tajikistan's mountainous province of Gorno Badakhshan (GBAO) and comprises about 63,700 km², with the highest peak (7495 m) in the Commonwealth of Independent States (CIS). Population has increased sharply in the last 50 years, and the territory today is home to 220,000 people.

The Pamir Mountains are demarcated to the north by the Trans Alai valley in Kyrgyzstan and the Wakhan Corridor in the South. The eastern margin of the Pamirs is bound by the Sarykol Range in China, while the south-western valleys draining into the Pandzh River mark the western boundary. The Pamirs are generally divided into the Eastern and Western Pamirs, largely along the 73° longitude line. Owing to their location, high altitude, and extreme bio-physical conditions, the Tajik Pamirs have developed into a most remarkable landscape, with moon-like high plateaus (3000–4000 m), rounded massifs, and large valley floors in the east, and deeply incised valleys with stunning glaciers and numerous traditional settlements nestled on alluvial fans in the west.

Land resources

Arable land is the scarcest resource in the Tajik Pamir environment. Most territory is barren, rocky mountain terrain with permanent snow, glaciers and debris, and only very limited biomass production. Landscapes

have been shaped by topography in combination with climatic patterns. These dominant factors influence the natural potential and create risks for human use.

In the Western Pamirs arable land accounts for approximately 240 km², or as little as 0.4% of the total area of the GBAO. Arable land and areas of settlement are located for the most part on alluvial fans and river banks. Given the minimal precipitation and the temperature regime, the vegetation period is limited to 200 to 230 days annually. Irrigation is necessary to achieve good yields, labour inputs are high, and the potential for mechanisation is very limited.

High mountain desert soils predominate in the Eastern Pamirs, allowing only very extensive forms of land use such as livestock grazing. Total pastureland area has been roughly estimated at 7,730 km²; few areas with mountain steppe soils along meandering rivers can be used for fodder production.

Following Tajik independence from the Soviet Union, a highly subsidised local economy that had been dependent on external resources was forced to turn to subsistence farming. Hunger relief was secured only through support from agencies of the Aga Khan Development Network, while agricultural production increased gradually. However, intensified agricultural production exceeded the natural carrying capacity in some areas, leading to degradation of soil and vegetation cover.

Limited fuelwood resources have been particularly negatively affected by economic transformation. Interruptions of the external fuel supply following the collapse of the Soviet Union put a heavy strain on forest lands in the Western Pamirs and on slow-growing *tereksen* shrubs in the Eastern

Pamirs, leading to an alarming degree of exploitation and clear-cutting of this vegetation.

Climate

The ridges of the highest mountain systems in the Western Pamirs, Hindukush, and Himalaya form a barrier against moisture borne by winds from the Indian and Atlantic Oceans, thus shaping a continental climate characterised by sharply contrasting temperature regimes and markedly seasonal precipitation. Great variability, particularly of rainfall, is a specific characteristic of the Pamir climate. This almost exclusively allows for irrigated farming only, using melt-water from snow and ice accumulated on the mountains in winter.

In the Western Pamirs the climate is characterised by moderately warm summers and moderately severe winters, with minimal rainfall in the summer months. The high plateaus in the Eastern Pamirs are part of the dry climate zone, with cold summers and severe winters with little snow (Badenkov 1992). The weather in the western valleys is influenced by the Afghan winds, which are responsible for summer dust storms and subsequent rainfall. The rainfall pattern in the Western Pamirs is characterised by a steep north-south gradient with more than 600 mm of rainfall from Ishkashim to the Darvaz mountain ridge. Similarly, the altitudinal increase in rainfall is exceptional: the long-term mean at the Fedchenko Glacier measurement station, at an altitude of 4300 m, is 2234 mm. However, the Irkht station (3290 m) at Lake Sarez, some 50 kilometers further south, measured average precipitation of just 110 mm between 1980 and 1998.

By contrast with the Western Pamirs, rainfall in the Eastern Pamirs increases during summer, whereas in most winters the high plateaus get no snow. Since total

Orogeny and denudation are the driving forces of modern relief processes in the Pamir Mountains, a highly active seismic region with numerous annual earthquakes. (Photo: D. Maselli)



annual rainfall is generally less than 100 mm, combined with high radiation, strong winds, and sub-zero average temperatures from October to March, the Eastern Pamirs must be regarded as a mountain desert.

Water resources

It is estimated that the Tajik Pamirs provide approximately 60% of the freshwater reserves of Central Asia. The vast majority of the 8492 mountain glaciers in Tajikistan are located in the Pamirs. They cover an estimated area of 7900 km² or about 12% of the GBAO.

Based on data for Tajikistan (Badenkov 1992), it has been estimated that the glaciers in the Tajik Pamirs contain approximately 425 km³ of water. This huge reservoir, along with considerable quantities of snow accumulated in winter, is a major asset for the arid Central Asian lowlands.

The maximum water discharge is observed from June to August, when snow and glacial melting is most intense. The melt-water peak during summer coincides with the growing period of cotton in the Tajik lowlands, and with the driest season in this region. Thus storage capacity and seasonal regulation of streamflow in the Pamirs are vital, not only for the local land-use system, but also for the ecological and socio-economic welfare of downstream users.

Water resources in the Pamirs, with an average discharge from the Pandzh River of 540 m³/sec after confluence with the Vanch River, combined with high relief energy, represent a great potential for hydropower generation. However, since markets are far away, natural hazards abundant, and investment costs high, the economic potential will remain limited.

Today growing concern is being voiced about the effects of climate change in the Tajik Pamirs. Between 1961 and 1990, an average temperature increase of more than 0.5° was measured. Rainfall, on the other hand, showed a declining tendency in the Western Pamirs, but increased in Murgab District in the east. These changes are corroborated by the retreat of various large glaciers in the Pamirs. The Fedchenko Glacier, with a current length of over 70 km, has shrunk by almost 1 km, losing 11 km² of its area and about 2 km³ of ice in the 20th century. If these trends continue, the Pamirs' function as a water tower is likely to diminish in the lowlands of Central Asia. In directly affected uplands, natural disasters will probably increase in scale and frequency, while the fragile mountain ecosystem is expected to degrade. This will threaten the agricultural production base, which is already marginal.

Geology¹

Geologically the Pamir Mountains constitute the bend of the Himalaya-Hindukush mountain massif, and were formed by the northward drift of the Indian craton and its final collision with Eurasia. Although there are no volcanic phenomena, strong convergence rates produce intensive seismic activity along the large fault systems in this region. Over 500 earthquakes with a magnitude greater than 5 on the Richter Scale have been registered since the beginning of the 20th century. The ongoing processes of orogeny and denudation are the driving force of modern relief processes in the Pamirs.

The Pamirs can be subdivided into 5 larger geological units: the Northern Pamirs, the Central Pamirs, the Rushan-Pshart Zone, the Southwestern Pamirs, and the Southeastern Pamirs. The Northern Pamirs are bordered by a Late Paleozoic suture, which wraps around the Pamirs from the western Hindukush through the Trans Alai

Valley to the Kurlung. In lithological terms, the Northern Pamirs consist of Precambrian to Paleozoic metamorphica, basaltic series, and marine sediments; ophiolite complexes and melanges are present in minor parts. The Central Pamirs contain a deformed and metamorphosed Precambrian to Paleozoic basement, covered by marine sedimentary rocks of the Paleozoic-Mesozoic era; terrigenous sediments and volcanoclastics are intercalated. The Rushan-Pshart Zone, with its complex tectonic structure, consists of Paleozoic terrigenous sediments in the northern part, followed by a transition of marine shallow to deep water deposits during the Mesozoic. Ophiolitic series are exposed in the southern parts. The Rushan-Pshart Zone reveals the remains of a small Mesozoic ocean basin. The lithology of the Southwestern Pamirs consists of metamorphosed Precambrian rocks (amphibolite-granulite facies) and Jurassic-Miocene granite complexes. The Southeastern Pamirs contain no igneous basements but only sediment successions. The Southeastern Pamirs probably represent the detached sediment cover of the southwestern basement.

Pamiri tradition has always included the mining and cutting of minerals for jewellery. The Tajik Pamirs have a large number of proven metallic ore deposits (gold, silver, molybdenum, mercury), building stones (marble, clay and loam), evaporates (mineral salt), gemstones (rubies, lazulite), and two coal deposits. Although the qualitative and quantitative features of certain mineral deposits are considerable, they will probably be of only minor economic significance (with the exception of coal deposits), owing to the high costs of exploitation.

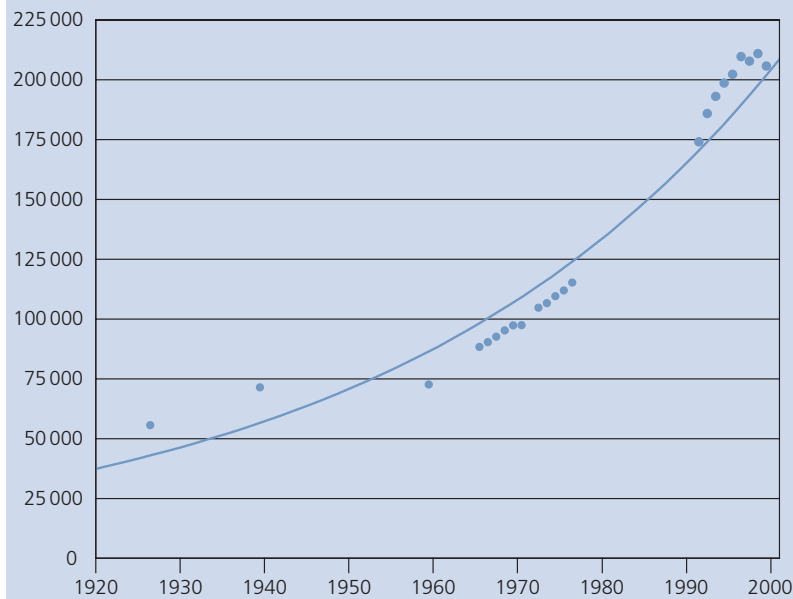
¹ This section is based on a contribution by Wolfgang Schatz.



The vast high plateaus of the Eastern Pamirs are characterised by minimal rainfall and sparse vegetation, and are suitable only for cattle grazing. This area of the Pamirs is inhabited mainly by people of Kyrgyz ancestry. (Photo: M. Domeisen)

Demographic development

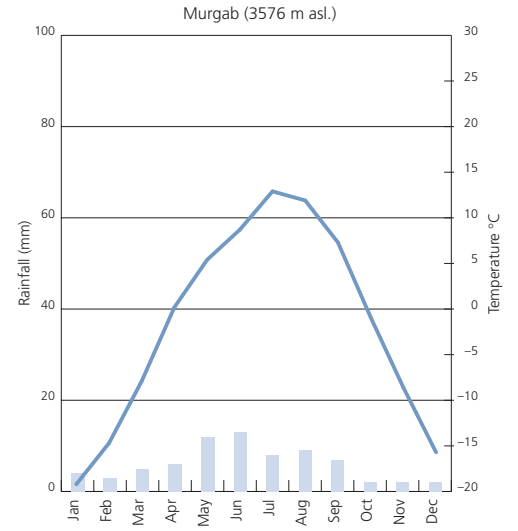
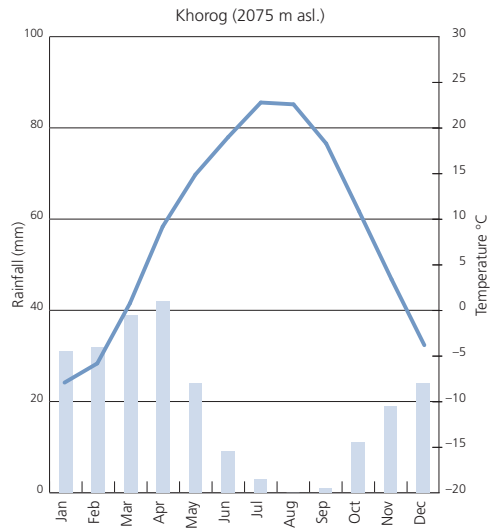
Under Soviet rule the Tajik Pamirs experienced rapid population growth in all of its 8 districts: from 56,000 inhabitants in 1926 to 220,000 by the end of 2000. Growth rates ranged from 250% for the Rushan district to 330% for the Vanch district. Despite this impressive increase, in relation to the total surface of the GBAO, the population density is still very low (3.5 persons per km²). Moreover, a closer look at the distribution of the population within the area reveals that settlements are markedly concentrated in the few fertile areas in the narrow valleys. The Soviet authorities actively promoted strong population growth to increase their presence in strategically important border areas. This policy did not take into account the limitations of natural resources in the Pamirs, which made it necessary to heavily subsidize the livelihoods of the GBAO population.



Population growth in GBAO 1926–2000



Climate diagrams for Khorog and Murgab, 1980–1998.
 (Source: Meteoservice of GBAO, 2002)





It is difficult to imagine life in Gorno Badakhshan without music and dancing. Pamiri dancing is highly rhythmic and uses complex and elegant hand movements. (Photo: R. Middleton)

The faces of the Pamiri people bear witness to mass migrations over many centuries. (Photos: R. Middleton)



A rich historical and cultural heritage

Robert Middleton

The territory of present-day Tajikistan was a crossroads for the many different ethnic groups that have controlled Central Asia over the past 3000 years. Cimmerian and Scythian tribes, several Persian dynasties, Macedonian/Greek armies under Alexander the Great, Parthians, Kushan Chinese, Huns, Hephtalites, Mongol hordes, Nestorian Christians, Arabs, Russians, even the British – all have left their mark on the region.¹

Arab invasions

Until the Arab invasions, beginning in the 7th Century CE, shortly after the death of the prophet Mohammed, most of Central Asia was under Persian influence or control. The Arab conquests in Central Asia under the Umayyad and Abbasid dynasties brought a flowering of Islamic thought, philosophy and mysticism and stemmed Chinese expansion in Central Asia. However, Persian influence remained strong, and new Islamic Persian dynasties sprang up, the most important of which was that of the Samanids (875 to 999). The Samanid period, marked by the scientific work of al-Khwarazmi, Ibn-i Sina (Avicenna), al-Biruni and al-Razi (Razes), and the poetry of Ferdousi and Rudaki, made a major contribution to the development of the cultural identity of the peoples that were subsequently to call themselves Tajiks.

The defeat of the Samanids by the Turkic Ghaznavid dynasty in 999 marked the beginning of the decline of Persian influence in Central Asia. From the end of the first century CE, there had been sporadic westward movements of nomadic Turkic peoples from the area of what is now Mongolia: the massive military invasions under the leadership of Genghis Khan (Temujin

1167?–1227) and Tamerlane (Timur-Lang 1336?–1405) ended Persian dominance in the region. Largely due to the protection provided by the mountainous terrain, the peoples of what is now Tajikistan were able to preserve their Persian culture. While the languages of Kazakhstan, Kyrgyzstan, Uzbekistan and Turkmenistan all have Turkic roots, Tajikistan is the only former Soviet Republic with an Iranian language; music, dance and poetry in the Persian tradition play a major role in Tajik society.

The “Great Game”

Until the Soviet period, the territory of what is now Tajikistan belonged to the Emirate of Bukhara. In the latter part of the 19th century, because of its geographical location at the confines of the Russian Empire and contiguous to China and British India, the region had considerable strategic importance. The “Great Game” between Russian and British adventurers, soldiers and diplomats – staking the limits of their respective Empires – was largely played out in the Pamirs and Hindukush (Hopkirk 1990). Subsequently, at the time of the Soviet invasion and occupation of Afghanistan (1979–1989), the Pamir region again assumed strategic importance for the Soviet Union as one of the main supply routes for the logistic support of Soviet military operations in Afghanistan.

The Soviet Union

After the 1917 Bolshevik coup d’état, the expansion of communist power in Central Asia was challenged by the remnants of the White Army and a strong resistance movement organised by indigenous tribes (the so-called “Basmachi” revolt); moreover, the embryonic Soviet state was faced with vigorous opposition (including more or less covert support to the Basmachis) from Britain, with imperial interests to defend in the region. These concerns led to the determined military subjugation and forced sovietisation of the native peoples of “Turkestan” in the 1920s. Under Stalin, the region – in particular the Fergana Valley, the most fertile area in Central Asia – was divided in 1924 between separate Soviet Republics in such a way as to maintain a mix of ethnic groups, the tensions between which could be exploited to justify the necessity of the strong centralising influence of the Soviet system. Tajikistan, initially an autonomous republic within Uzbekistan, became a federated Soviet Socialist Republic in 1929.

The sovietisation of Central Asia, while imposing a degree of communist orthodoxy, did not lead to the destruction of local culture and religion. Soviet rule brought substantial economic and social benefits for the Republics of Central Asia far superior to what was achieved in the former British Empire just across the Wakhan Corridor.

Independence and civil war²

When the Soviet Union broke up in 1991, Tajikistan became an independent state but was immediately faced with the economic problems associated with the breakdown of the centrally planned Soviet economy. At the end of the Soviet period, power in Tajikistan was tightly guarded by representatives of the Leninabad district in the

The Zulkhomor castle above the village of Yamchun dates from the 3rd century BCE and incorporates a Zoroastrian temple. (Photo: R. Middleton)



north. Following the ideas of Gorbachev's *perestroika* and *glasnost*, Tajikistan was the first ex-Soviet Republic to hold free elections in 1991.

The new "Democratic Party" had formed an alliance against the ruling Communists with the "Popular Front" (Rashtokhez) and the "Islamic Renaissance Party", a moderate Islamic organisation. The opposition presidential candidate – a popular film-maker with origins in Gorno Badakhshan – was beaten by the communist candidate, but his tally of some 30% of the votes put pressure on the government to open the country to a multi-party system.

This call for power-sharing along with the complex ethnic and regional tensions from the legacy of the boundaries attributed to the new Soviet Republics in 1924 finally led to a civil war in 1992. With support from the southern region of Kulyab (and, it is claimed, of the Russian military forces stationed in Tajikistan), the leaders of the government faction defeated the opposition coalition forces recruited essentially from fighters of Pamiri (Gorno Badakhshan) or Garmi (Karategin/Rasht) origin. Large numbers of people from these mountainous regions had been relocated in the 1950s to the cotton-growing areas of the south-west (Kurgan Tyube); in Dushanbe, the capital, many of the intellectual elite were of Pamiri origin. Exactions against these groups in the aftermath of the civil war forced approximately 50,000 Pamiris and Garmis to return to their traditional homeland. Many fighters fled to Afghanistan and subsequently returned with fundamentalist ideas gained there in the refugee camps, mainly to the Karategin valley but also to a few predominantly Sunni areas in the North of Gorno Badakhshan. The result was a sharp polarisation of national politics and the radicalisation of the Islamic Renaissance Party.

Peace agreement

After initial negotiations between the fighting parties in 1994, the civil war continued at relatively low intensity – mainly through sporadic cross-border incursions from Afghanistan – until June 1997, when a peace agreement was signed between the government of Tajikistan and the United Tajik Opposition. This agreement opened the way for an interim "power-sharing" government and Presidential and Parliamentary elections; it also provided for the integration of opposition forces into the regular armed forces of Tajikistan. In November, President Emomali Rakhmonov was re-elected for a seven-year term, and, in March 2000, elections were held for the upper and lower houses of parliament, in which the former opposition parties did not make a strong showing (around 10% of votes).

Although the speed in reaching agreement was undoubtedly influenced by the unstable situation in Afghanistan, the peace accord was nevertheless a remarkable achievement; its subsequent relatively problem-free implementation is even more remarkable. After a civil war characterised in its opening stages by extreme brutality,³ the integration of former fighters in the national armed forces and in civil life has been exceptionally smooth: the process can indeed be held up as a model for other inter-community or ethnic conflicts in countries with considerably higher economic and social resources than Tajikistan.

History of Gorno Badakhshan

The first traces of civilisation in the Pamirs go back more than 20,000 years. Some 50 human settlements from the Stone Age, together with a number of cave paintings and petroglyphs, have been found in the Eastern Pamir. There are many castles dating from as early as the 3rd century BCE.

Traces of the multicultural history of this major crossroads of the Silk Route can be seen: Zoroastrian ritual sites, Buddhist stupas and ancient shrines.

Modern history⁴

In 1891, when the tsars founded the city of Murgab as a military outpost, no one could have foreseen that the region's boundaries with China and Afghanistan would continue to be guarded by Russian soldiers up to the present day. At that time, borders as we know them now did not yet exist. Nevertheless, the "Great Game" for supremacy in the heart of Asia had serious consequences for the local population. In 1895 the joint British and Russian border commission established local borders without consulting any local representatives. These borders, drawn in European fashion along the Amu Darya River, cut through the middle of settlement areas and economic regions inhabited by local farmers; they also became insurmountable barriers for Kyrgyz nomads, who could no longer practice seasonal pasture migration. This led to large flows of migration. Today's districts (*rayons*) in Gorno Badakhshan – Shugnan, Rushan, and Ishkashim (Wakhan) – cover merely parts of the territories that once belonged to principalities; the other parts now belong to Afghanistan.

In 1923, Gorno Badakhshan was integrated into the Turkestan Autonomous Soviet Socialist Republic (ASSR) as the so-called Autonomous Pamir Vilayat. Two years after the disintegration of the People's Republic of Bukhara and the foundation of the Tajik ASSR, Gorno Badakhshan Autonomous Oblast, or GBAO in short, was established. It was given its present form within Tajikistan in 1932 through the establishment of five *rayons* in the Western Pamirs and one in the Eastern Pamirs. Khorog as a regional administrative centre was granted the status of a city.

Livelihoods and agricultural systems are still very traditional on the other side of the Pandzh River in Afghanistan. Contacts between the Tajik and Afghan Badakhshani are limited, although they belong to the same ethnic groups. (Photo: D. Maselli)



The *oblast's* autonomous status was intended, on the one hand, to assure conservation of national and ethno-linguistic differences and, on the other hand, to reduce development deficits in comparison with Russia and urban areas.

Shortly after Tajik independence in December 1991, formal and confirmed autonomy as an integral part of the Tajik constitution was demanded in several demonstrations in Khorog. In 1995 the Majlisi Oli (High Council) of the Tajik Republic formally adopted the status of autonomy of Gorno Badakhshan. The adoption of Article 110 of the Tajik constitution led to intense discussions, and fears were voiced that once given limited autonomy, Gorno Badakhshan could gradually separate from the Tajik Republic and finally form an independent state with the neighbouring territories of Afghan Badakhshan.

Civil war

Gorno Badakhshan was not at any time since 1992 a home or hotbed of hard-line Islamic opposition. Some parts of Gorno Badakhshan (Sagridasht and the Vanch and Yazgulom valleys) were indeed occupied by armed opposition groups until the Peace Agreement was signed in 1997, but did not serve as a base for launching attacks either on government troops or Russian border guards: most such attacks came from across the frontier in Afghanistan. Many Pamiris fought in the civil war alongside the followers of the Islamic Renaissance Party and created their own militia. In 1995, however, the leaders of the Pamiri militia gave a solemn pledge to His Highness the Aga Khan, spiritual leader of a large number of Pamiris, that they would never initiate hostilities against the State or the Russian forces. Despite much provocation – including the poisoning of their leader, Majnoon Palaev, in June 1996 – this pledge was respected.

Culture and religion in Gorno Badakhshan

The territory of present-day Tajikistan was part of the Iranian Empire, the religion of which was Zoroastrianism. When the Iranian Sassanids were defeated by Umayyad Arab armies in 636, Islam gradually spread throughout the Central Asian region. The religion of the vast majority of Tajikistan's population today is Sunni Islam. In the Pamirs, however, a large number of people profess the Ismaili faith (i.e. are followers of the Aga Khan). The Pamiris were converted to Ismailism in the 11th century by the Persian poet, traveller and philosopher Nasir Khusraw.

In a manner reminiscent of Switzerland, Badakhshan is marked by considerable linguistic and cultural heterogeneity between the peoples of the different main valleys. The religion of the Northern districts of Darvaz and Vanch is Sunni Islam; their language is Tajik, with the exception of the Yazgulom valley, where the Yazgulomi dialect is spoken. The religion of the districts of Rushan, Shugnan, Roshtkala and Ishkashim is Ismaili Shia; Shugni is understood in all these districts, but many people in Ishkashim speak Rehne and Wakhi, as do their neighbours across the Wakhan Corridor in Pakistan – these dialects are not understood by Shugni speakers; Rushan and the Bartang valley also have their own dialects, close to Shugni. The people in these districts are ethnically Indo-European and would probably consider themselves European by education and Persian by culture. In the high plateau district of Murgab, the population is mainly ethnic Kyrgyz, of Sunni Muslim confession, with a significant minority of Ismailis. The Murgab people were essentially nomadic herders until the 1950s, when villages were built for them; in the summer a large number still migrate with their herds of yak and a few cows, to set up their yurts in the pastures.

Traces of Zoroastrian traditions remain in Gorno Badakhshan, for example in the role of fire in wedding ceremonies and in the symbolism of certain structural details of traditional Pamiri houses. Such symbols are also found on the beautifully decorated skullcaps. Other typical Pamiri handicrafts include decorative embroidered cloths (*suzanis*) and knitted socks and gloves in bright colours. Old Pamiri jewellery can still be found, comprising primarily necklaces made of coral (which are reportedly found in deposits near Alichur) with silver decorations and rings with spinel stones. There is a saying in Tajikistan that the people from Leninabad govern, those from Kulyab fight, in Garm they pray – and the Pamiris dance. Certainly it is difficult to imagine life in Gorno Badakhshan without the perpetual accompaniment of music and dancing. Every village has excellent musicians, young and old, as well as expert dancers. Men and women dance together, although there is no contact. Women perform as solo singers and occasionally as accordion players.

1 See *History of Civilizations of Central Asia*, UNESCO, Paris 1996; *The Resurgence of Central Asia*, Ahmed Rashid, Zed Books, London 1994; *Samanid Renaissance and Establishment of Tajik Identity*, Iraj Bashri, 1997.

2 See *Tajikistan: Disintegration or Reconciliation?* Shirin Akiner, London 2001; *Rand Corporation, US and Russian Policymaking with Respect to the Use of Force, California 1996 – Chapter 3, Tajikistan*, by Arkady Dubnov.

3 See the *Amnesty International report Tadjikistan – Hidden terror: political killings, 'disappearances' and torture since December 1992, May 1993*.

4 *The paragraph on the modern history of the GBAO before the independence of Tajikistan is mainly based on Kreutzmann (2002)*.



Old Pamiri jewellery and decorative cloths called *suzanis* show the long tradition and high standard of handicrafts in Gorno Badakhshan. (Photos: R. Middleton)



Location of the Pamir Mountains in Central Asia

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An appraisal of sustainability dimensions



part III

Development trends
in the Tajik Pamirs



A humanitarian catastrophe following the collapse of the Soviet Union was avoided only by massive external food aid. Food aid has been reduced in the meantime, owing to significant increases in agricultural productivity. (Photo: P. Sieber)



Trade, practically unknown under Soviet rule, is increasing and becoming a component of the local economy. (Photo: U. Lutz)



AN ECONOMY IN TRANSITION

Towards a new economy

Thomas Breu and Hans Hurni

On the eve of the collapse of the USSR, Tajikistan was the poorest and least industrialised republic of the Soviet Union, with a gross domestic product (GDP) amounting to only 0.6% of the total for all the Soviet states. Tajikistan was hit harder than the other Central Asian states by the process of economic transformation. By 1997, Tajikistan's gross domestic product (GDP) had shrunk to less than 50% of what it was in 1991. Moderate and continuing economic growth at the national level was achieved after 1997, as a result of joint efforts by the international community and the Republic of Tajikistan, which implemented economic reforms.

Tajikistan's role and responsibilities under the Soviet system can be summarised as follows: the northern area was the centre of industrial production (e.g. aluminium). The south-western areas had the primary task of producing cotton, whereas Gorno Badakhshan in the south-east was assigned the responsibility to secure the borders with Afghanistan and China. Hence the GBAO was not expected to produce any significant agricultural or industrial output.

From a planned economy...

The economic system in the Tajik Pamirs enjoyed a high level of recognition. Gorno Badakhshan received enormous subsidies from the central government in Moscow. Employment was guaranteed, and all jobs were secure and relatively well paid. Compared with other provinces (*oblasts*) in

Tajikistan, many families enjoyed an above-average standard of living: television sets, household appliances, and even private cars were rather common. Even though domestic food production covered only 20% of demand, food supplies were secure. Infrastructure, public services, and social security reached a high standard, particularly when compared with the neighbouring countries of Afghanistan and northern Pakistan. Cultural life was highly developed, with theatres, cinema, and concerts – all of which was often organised at the village level. Women enjoyed a high status in the socio-political system, received promotions, and occupied high posts in the government and the state-owned industrial sector.

...to a market-oriented economy

Since 1989, but especially between 1991 and 1993, local industrial and agricultural production decreased rapidly, along with drastically diminishing support from the central government. At the peak of the crisis in the mid-1990s, which coincided with a large number of refugees seeking shelter from the civil war, the previous economic system collapsed to a great extent, and a humanitarian catastrophe was averted only through relief programmes coordinated by the Aga Khan Development Network. In this period remittances from Pamiris working in Dushanbe, Russia and other CIS countries became increasingly important for the GBAO economy; up to the present they still constitute an essential source of income for many families.

Today economic structure in the GBAO is characterized by the dominance of a subsistence-oriented agricultural sector. Local agricultural production has increased significantly since 1996, especially on privately managed farmland in areas with good biophysical conditions. Agricultural production and food self-sufficiency are still insufficient in marginal areas, and a large share of the local population remains dependent on food aid. The industrial sector is dominated to a great extent by the power industry, complemented by a small number of old Soviet plants trying to adapt to the market economy, and by a growing number of newly established small-scale enterprises. The service sector is still heavily dominated by education, health and administration. The health and education sectors in particular, given their current size and structure, are not capable of surviving economically without external assistance. There has been virtually no development of a private service and trade sector. With the collapse of the Soviet Union, limited trade relations and traditional sales markets dwindled. Despite some efforts, particularly to improve the transport infrastructure, the economy of the GBAO is still very isolated, and trade with neighbouring countries is almost non-existent.

In general, the pace of economic transformation in Gorno Badakhshan is rather slow. In particular, it seems to have taken a relatively long time for a majority of the people to recover from the shock of the disappearance of the Soviet system and to show self-initiative. But economic transformation has also been hampered by frequently unfavourable regulations and economic conditions.



Distant markets, rigid customs regulations and barely developed trade relations with its neighbours in China and Afghanistan are among the obstacles to economic development in Gorno Badakhshan. (Photo: U. Lutz)

Basic conditions for the development of small-scale enterprises require further economic growth. This includes provision of start-up capital and training. (Photo: D. Maselli)



Employment conditions¹

There has been a sharp increase in unemployment rates in the GBAO. Among the reasons for the increase in unemployment were the reshuffling and closure of industrial complexes and reforms in the governmental administration. In Gorno Badakhshan the deteriorating labour market was also strained by approximately 50,000 war refugees. Between 1990 and 2000, the total number of persons employed in the oblast of Gorno Badakhshan decreased by 42.7%, leaving an estimated 80% of the population either unemployed or underemployed at the peak of the recession (Mamadsaid 1997). The majority of the population had no income during this time. People who were still employed and continued to work as teachers, administrators or labourers in one of the remaining operating factories were either not paid or paid only after great delay. Today the salaries of formerly relatively well-paid employees are often less than USD 10 per month, and pensions diminished by inflation are of little more than symbolic value.

Although many governmental jobs were abolished during the past decade, the proportion of state employees among all employees in the GBAO has remained more or less stable. In 1990, while the Soviet system was still in existence, the proportion of persons employed by the state compared to the total number of employees was 86.6%. Despite extensive reforms, jobs provided by the state still hold the lead, their percentage having been only slightly reduced to 85.6% in the year 2000, while the total number of jobs stood at 25,790.

Fortunately, the employment situation seems to have become less critical in the last two years. Yet the number of officially employed persons is only gradually increasing, while the share of workers employed in the informal sector is steadily growing. Some years ago, for instance, selling a few

products on the street was an expression of the struggle for survival. Nowadays, such activities have become a permanent part of the local economy.

Winners and losers in a changed system

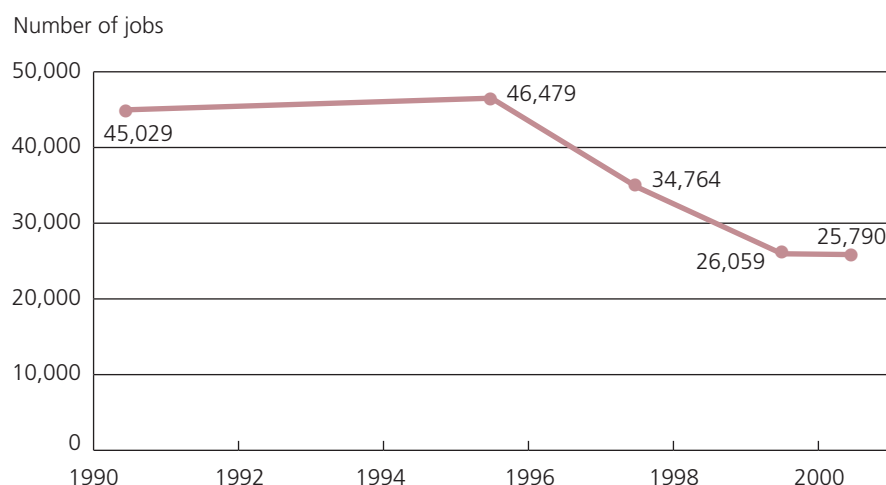
Only a limited number of people have been able to profit from the economic transformation and enjoy the chance to operate on a higher scale as 'businessmen', with the necessary capital. Some managed to 'privatise' former state property and are now operating profitable businesses on this basis. However, these few winners are an exception. The great majority of the population experienced a sharp decline in standard of living under the new economic system.

Young people, retired persons and women have been particularly affected by the changes. Young people who have graduated from university are often forced to seek employment in other parts of Tajikistan or other former Soviet republics.

Those who remain have little choice but to work in agriculture or the public service sector. Retired persons with minimal pensions who often depend completely on family ties and are unable to adapt to the new situation, must be regarded as the people most affected by the transformation. Finally, the importance of the role of women in society seems to have diminished, and there is evidence that women are disproportionately affected by the shrinking labour market.

Although the worst crisis has been overcome, thanks to enormous external inputs and internal efforts, the GBAO is still not able to survive on its own. Agricultural production needs to be increased, trade and industry must become more competitive, and new job opportunities must be created. If the high level of education is exploited and the cooperation of all stakeholders can be secured, these goals seem attainable in the medium to long term.

¹ This chapter is based on a report prepared by Islomkhuja Olimov, a Master's thesis by Patrick Sieber, and local statistics.



Employment (all sectors) in Gorno Badakhshan from 1990 to 2000. (Source: GBAO Statistical Department, 2000)



Yapshorv, a typical village in the upper Bartang Valley, with 230 inhabitants, located on an alluvial fan. There are virtually no options for expanding the area under agriculture. (Photo: J. Schneider)

AN ECONOMY IN TRANSITION

Valley agriculture in the Western Pamirs

Thomas Breu and Hans Hurni

Deeply incised valleys in the Western Pamirs and large high plateaus in the east, in combination with different climate characteristics, were responsible for the emergence of two main agricultural systems. The valleys of the Western Pamirs are dotted with villages where the population engages mainly in irrigated farming, whereas the vast high pastures of the thinly populated Eastern Pamirs are suited for livestock production.

Characteristics of the farming system

Virtually without exception, farming in the Western Pamirs is possible only in the proximity of the Pamiri settlements on valley bottoms along rivers and on alluvial fans. The major limiting factors for farming are the harsh climatic conditions, with long winters and minimal annual rainfall, and the sparse amount of agricultural land, owing to the wild mountain relief. Finally, and most important, is the availability of water. To optimise yields on very limited arable plots averaging 0.12 ha per person, almost all arable land that can be traditionally irrigated has been used in recent years in an effort to raise productivity.

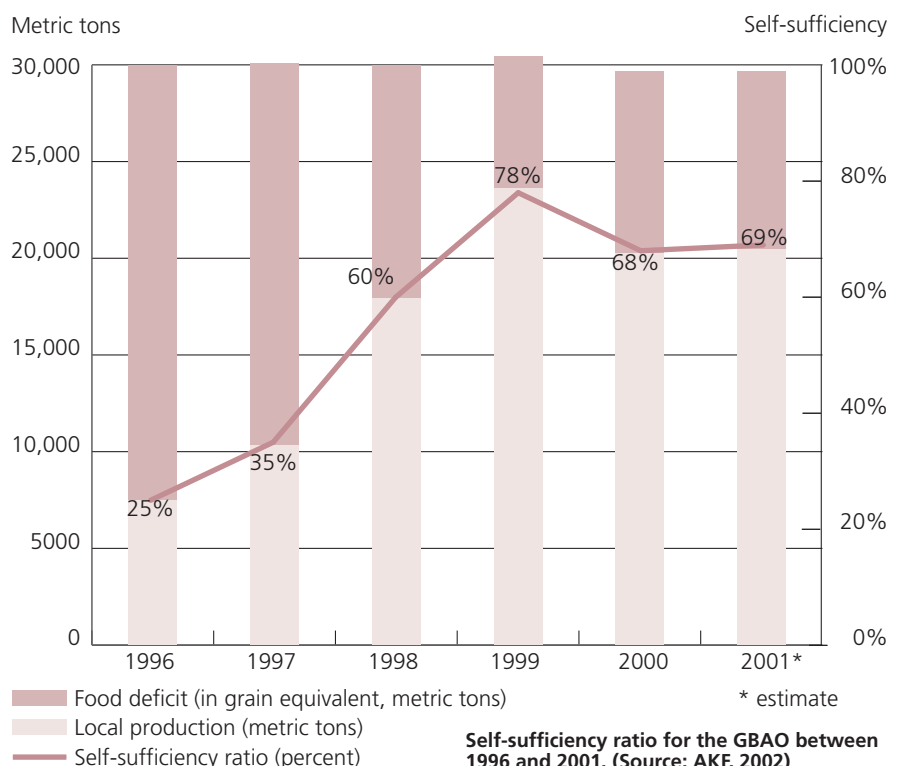
Cereals, local varieties of wheat and barley, potatoes and pulses are grown on these small plots. Orchards with many varieties of fruit trees and vegetables, often combined with livestock grazing, complete the list of agricultural products. This form of agriculture corresponds to that practiced in neighbouring mountainous regions and is known as 'mixed/combined mountain agriculture' (Herbers 2001a).

Agriculture under Soviet rule

During the Soviet era a fragmented and sectorally specialized economic system was established. Cotton was expected to become the main agricultural product in Tajikistan. But due to its strategic location as a buffer to Afghanistan and China, no significant agricultural production or industrial output was expected from the GBAO, which was located too high in the mountains to produce cotton.

The Soviet system was characterized by the abolition of private land ownership and the introduction of *kolkhozes* and later on

sovkhozes. The first *kolkhozes* in the GBAO were established in 1937. In these collective enterprises, capital and productive assets – apart from the land itself – belonged to the workers. Salaries were paid in farm products and were dependent on the profit earned by the enterprise. Then, in 1975, all *kolkhozes* in the GBAO were turned into *sovkhozes*. These state enterprises were created to improve production. Not only the land, but also all other property now belonged to the state, and the workers became state employees with fixed salaries regardless of the profitability of the *sovkhozes*. The introduction of *sovkhozes* also brought a change in production targets. As late as 1965, 76.3% of the arable land was still used for cultivation of foodstuff and only 23.7% for fodder. In 1987, however, 69.8% of the area under cultivation was used to produce fodder, 4.8% to



Wheat threshing with oxen in the Ishkashim valley as a result of the demechanisation of agriculture after 1991. (Photo: C. Hergarten)



Kitchen gardens play an important role in the subsistence of local communities. Vegetables such as onions, tomatoes, carrots, pumpkins, cabbage, beans, cucumbers and maize are intensively cultivated. (Photo: M. Degen)

cultivate tobacco, and only 25.4% for production of foodstuffs (State Committee on Statistics, Tajikistan 1987). As a result, only 10–20% of the region's requirements for foodstuffs were met locally (Herbers 2001a, p. 371), and Gorno Badakhshan became greatly dependent on external supplies. In connection with the changes mentioned above, many new jobs were created, with a majority of those employed working outside the agricultural sector. Nevertheless, there was a lack of jobs in the GBAO. Many Pamiri therefore migrated to Dushanbe or other cities in the country to improve their skills and find new jobs (Herbers 2001b).

Agrarian transformation

In 1992, following the collapse of the centrally planned Soviet economic system, serious food and energy shortages began to be felt in Gorno Badakhshan.

In late 1993, at a time when self-sufficiency in the GBAO was at a level of just 15%, the local government decided that unused or under-utilised state farmland could be distributed to villagers who wished to become private farmers. At the national level, a Land Code for the Republic of Tajikistan, paving the way for privatisation, was only passed in 1995. Village by village, the land and livestock of the former *sovkhozes* were distributed equally to every household in the GBAO. As a result, many very small family enterprises were created, often lacking traditional and comprehensive farming knowledge due to the division of labour in the previous agricultural system.

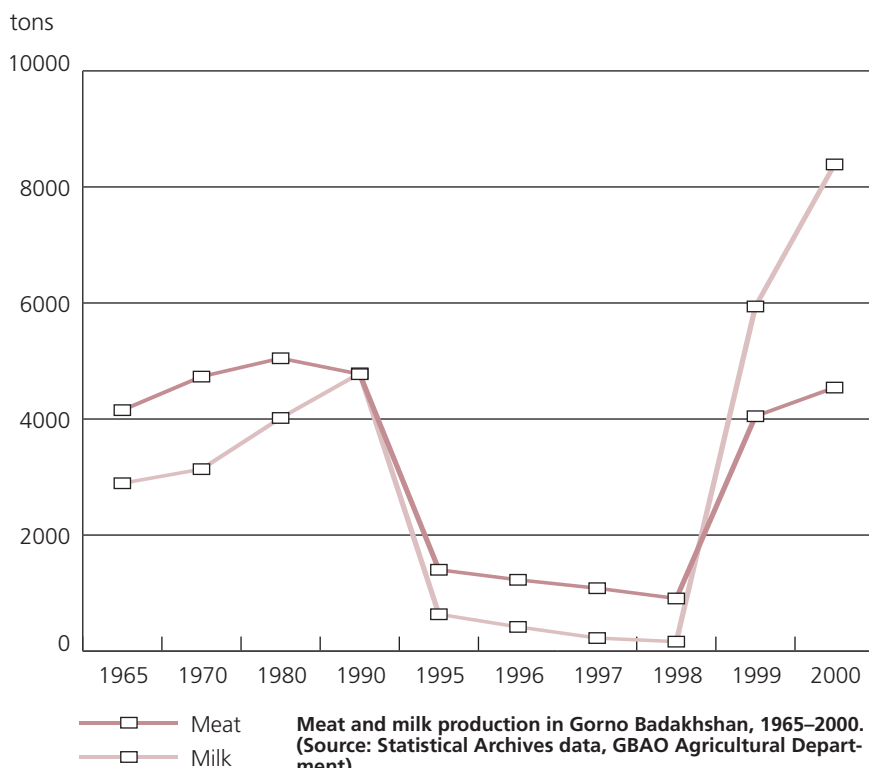
To counter these sub-optimal start-up conditions, private farmers were given technical assistance by the Mountain Societies Development Support Programme (MSDSP), and they received improved seeds and fertilisers on credit. A channel building programme was initiated to increase the amount of arable land available to private farmers, and suitable crop varieties were

introduced. Since then, almost all state farmland has been placed under private management. The total area of land under private management is now more than 11,000 hectares. Yields of potatoes and wheat per hectare have more than doubled and today cover an average of almost 70% of staple food requirements. In 2000, however, Central Asia was severely affected by a drought, which resulted in a decline in agricultural production (see figure to the left). Despite this overall very positive development, substantial discrepancies remain between districts and villages, and particularly within local communities.

Like the land, livestock was also privatised. It was distributed equally among the population, except for yaks, which are seriously threatened by a steady loss of yak breeds. After a sharp drop in production between 1990 and 1995, milk and meat production remained at a critically low level until 1998 (see figure below). Only after

1998 did the production rate for milk and meat increase significantly, in all probability due to restructuring in the agricultural sector and the urgent need for foodstuffs.

Although the improvements made in terms of food production and yields are very positive, they were achieved partly at the expense of land quality. Several villages have recorded a serious increase in degraded land with declining yields. In most cases this is due to overuse of the land and inappropriate irrigation techniques. Against this background, it is questionable whether complete food self-sufficiency, which can probably be achieved only through demanding land reclamation, intensification and optimised cropping systems, is the only approach to improving rural livelihoods. As in other mountainous areas, the key to sustainable agriculture may be development of other economic activities based on farming.





Kyrgyz pastoralists have traditionally used the pastures in the Eastern Pamirs. (Photo: U. Lutz)

Typical summer pasture area in the Eastern Pamirs. As transport costs have increased significantly in recent decades, remote pastures often go unused, whereas pastures near settlements show signs of overgrazing. (Photo: P. Sieber)

Teresken and formed dung are the major source of energy for heating and cooking. However, the slow-growing *teresken* shrub is also an important fodder plant for domestic and wild animals, and protects soils from erosion. (Photo: J. Hangartner)



AN ECONOMY IN TRANSITION

Managing high pastures in the Eastern Pamirs

Eva Ludi¹

The Eastern Pamirs, with less than 100 mm of annual rainfall and altitudes above 3000 m, are predestined for livestock raising. Traditionally, the area has been inhabited by semi-nomadic people of Kyrgyz origin who migrated seasonally with their yak and sheep herds to areas at various altitudes. The first permanent settlements were established only in the 1930s, under Soviet influence. In 1894, the year of the first census, 1055 people lived in Murgab District. At the same time, on an area of almost 40,000 km², corresponding to the size of Switzerland, 20,580 sheep, 1703 yaks, 280 horses, and 383 camels were counted (Hedin 1899, quoted in Hangartner 2002). The introduction of intensified pasture management by the Soviets led to decades of tremendous growth. A decline in the livestock population began at the end of the 1970s and gained great momentum after the economic and political transformation that began in 1990. Since the first census there has been steady growth in the number of people in the Eastern Pamirs, which slowed only after the independence of Tajikistan. Today Murgab District is inhabited by 16,000 people.

Pasture management under change

During the Soviet period, large herds of animals were kept on remote pastures with good quality fodder. Livestock breeding was well organised, with mobile herding camps and irrigated winter pastures around permanent settlements, fertilised and irrigated plots producing fodder barley,

imported fodder, well-established veterinary services, and scientifically based breeding strategies. Animals were then transported to other areas of the Soviet Union, and the Pamirs received financing, consumer goods, fuel and coal, and social and economic services in return. The disintegration of the Soviet Union and the collapse of the planned economy also had far-reaching consequences for the livestock sector in the GBAO. State farms were dissolved and the assets distributed to former employees. Supplies of necessary goods, maintenance of infrastructure, and provision of economic and social services also came to a halt. Former employees suddenly lost their income and became independent farmers who, in the absence of markets, had to revert to a subsistence mode of production based mainly on animal and dairy production. Today, many inhabitants of the Eastern Pamirs depend on humanitarian assistance, as employment opportunities in the secondary and tertiary sectors are not available and income from livestock production is far below household needs.

Herding patterns

Herding patterns vary considerably among households, depending on stocking rates and the socio-economic status of households. Nevertheless, certain general features can be described: herding in the Pamirs is a combination of vertical transhumance and semi-nomadism. Generally speaking, different pasture areas exist, depending on the season: summer pastures at altitudes between 3500 and 4700 m are

used between July and September up to November, winter pastures near settlement areas in the valleys between December and May. Some herders use spring and/or autumn pastures in between. Hay fields located in the vicinity of rivers are of great importance for the provision of winter fodder. High mobility is important with regard to conservation of vegetation, but also as a means of adapting to changing climatic conditions.

Since the privatisation of livestock, herding patterns have changed considerably. Various summer pastures that are difficult to access due to remoteness or deteriorated infrastructure are no longer used. Herders mention that some of the best summer pastures, accessible with heavy lorries during the Soviet period, are no longer used now because fuel prices are simply too high.

Access is a limiting factor not only in pasture use but also in terms of market integration for the Pamirs as a whole. This has serious negative consequences for the livelihoods of herders. The main markets, either within the country or in neighbouring Kyrgyzstan, are difficult to reach. Exporting livestock and livestock products is difficult, as is provision of consumer or investment goods. As a result, the price ratio of locally produced to imported goods forces herders to retreat to a subsistence mode of production. A comparison of the number of people who depend on livestock production with the potential carrying capacity of the area indicates that the current population of 16,000 is clearly higher than the number of people who can fully depend on sustainable livestock production, which is estimated at between 3000 and 5000. Consequently, few herding households in the area are able to produce a surplus; many more have to sell animals to survive.



Milking of yaks in the early morning in Ak Kalama, in Chechtebe in the South-Eastern Pamirs. At altitudes of 3500 m and above with very limited rainfall, little vegetation can develop. It is particularly challenging to produce enough winter fodder for large herds. (Photo: P. Sieber)



Deteriorating resources

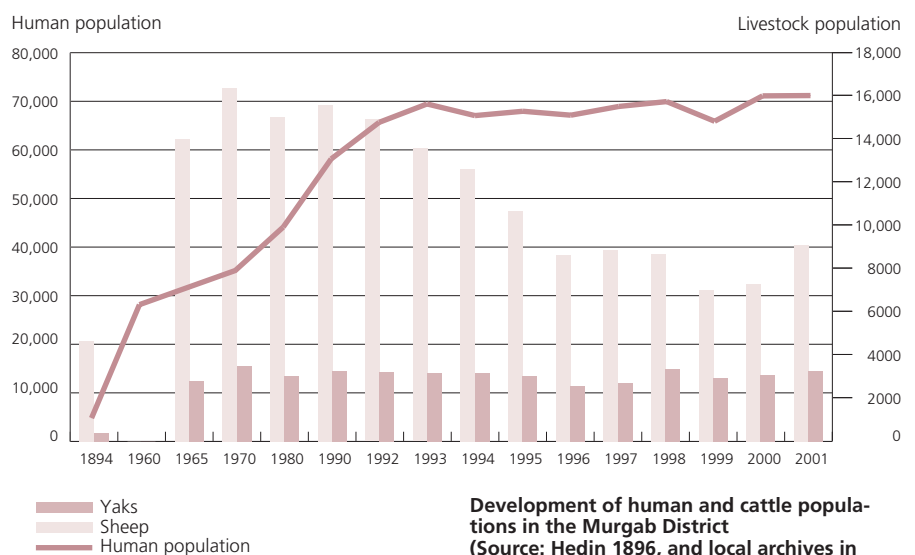
The concentration of people and livestock on pastures near settlement areas, in combination with the collapse of the supply and transport system, triggered degradation of vegetation. Pastures near settlement areas are overgrazed because herders cannot afford to move to distant pasture areas. On underused pastures, on the other hand, productivity may also decline because biomass production is reduced by old plants. As the supply of fuel and coal has decreased and prices have risen sharply, people increasingly use local shrubs such as *teresken* for heating and cooking. However, this small, slow-growing shrub is also an important fodder plant that protects slopes from erosion. Livestock have become more vulnerable, particularly during harsh winters, as a result of degrading land resources and the cessation of winter fodder imports.

The search for solutions

Strategies to promote sustainable development need to focus on increased productivity through livestock breeding, a culturally and ecologically well-adapted strategy for the Pamirs. New forms of livestock production based on units larger than households have been proposed as a strategy to make better use of remote pastures. Activities along these lines were initiated following the establishment of Farmers' Associations. The main tasks of these associations are related to land use regulations such as distribution of pastures and hay plots to

households. They also represent their members' interests to the local administration, and develop marketing and processing strategies. And the Farmers' Associations have played an important role in strengthening the limited knowledge of former *sovchoze* workers who turned to herding. There is a particular need for the introduction of breeding strategies and training courses in sustainable pasture management. The associations could also be coordinating bodies for pooling household resources or facilitating access to markets,

Even if the above measures are taken and result in a sound increase in production, subsistence-oriented livestock breeding alone cannot support all the households currently engaged in this sector. Additional sources of income in the secondary and tertiary sectors are needed to decrease dependency on income from the livestock sector and on food aid. Small production units linked to the livestock sector could represent an opportunity for creating added value in the Eastern Pamirs.



Development of human and cattle populations in the Murgab District (Source: Hedin 1896, and local archives in Murgab, quoted in: Hangartner 2002)

an integral part of which would involve the lifting of current restrictive import and export rules. Provision of winter fodder is a bottleneck that needs to be addressed when considering how to increase productivity in the livestock sector. Areas where hay can be produced are limited in the Pamirs; hence intensification on existing meadows is a precondition.

¹ This article is based on studies by Judith Hangartner and Michael Domeisen (both 2002).



Outdated infrastructure reflects the remnants of Soviet industrialisation in the Pamirs. Mechanical breakdowns often result in the dismissal of employees, as parts are irreplaceable. Marble processing factory near Vanch, GBAO. (Photo: P. Sieber)

There is good potential for a variety of forms of tourism in the Tajik Pamirs. Infrastructure and human resources must be developed and entry formalities should be simplified in order to tap this potential. (Photo: E. Kleinn)

AN ECONOMY IN TRANSITION

The industrial and service sectors

Patrick Sieber

Prior to the Soviet era, the population of the Pamir Mountains lived from a form of subsistence agriculture that did not differ from the predominant way of life in neighbouring mountain areas. With the integration of the Gorno Badakhshan *oblast* into the Soviet Union, extensive delivery of goods and services led to a much higher standard of living, representing the beginnings of modest industrialisation and the development of a fairly small service sector.

Inherited structures

The industry that developed during the years of Soviet rule was largely characterised by two features: it was planned as a source of supply for the Russian industrial apparatus, and it was not designed to function autonomously at the regional level. Given the remote location of Gorno Badakhshan, production was only possible thanks to a well-developed supply and transportation system that did not have to account for transportation costs. The result was a lopsided and fragmentary industrial structure that consisted of power production, stone processing enterprises, factories processing agricultural products, and some light industry. With the collapse of the Soviet Union, the influx of goods and raw materials was abruptly stopped, and vital economic relations with neighbouring republics deteriorated. The result was greatly reduced industrial production.

In terms of supply, the tertiary sector focused almost exclusively on the development of public services, such as education and health services, along with local administration. Service enterprises, for instance in the tourism, trade and financial sectors, barely existed.

The region has experienced modest economic transformation since the time it was on the verge of widespread famine in the early 1990s. Markets have developed, and the first private small-scale enterprises have emerged. There are great expectations that measures will be implemented to stimulate the development of such enterprises. But persistently rigid legislative regulations and the difficulty of coming up with appropriate credit schemes have been obstacles to success. To counteract this stalemate, development agencies have initiated business support programmes that provide a considerable volume of badly needed start-up credits. Public services in the education and health sectors have been maintained at minimal levels, thanks to support programmes run by NGOs working in the region.

Current difficulties

Despite some progress, long-term material security remains uncertain, while the economic situation and the condition of public services leaves the population highly vulnerable to any crisis.

The region still lacks a sound industrial base, and only a few remnants of the fragmentary Russian industrial structures continue production – all of which are in desperate condition. Most large plants were unable to survive under the new economic conditions: they have great overcapacity and rely in most cases on raw material deliveries from abroad. Moreover, little has changed in the unbalanced industrial structure in the oblast – almost 90% of the proceeds of industry originate from power production, an economic sector that employs only a small percentage of the available labour force. The number of jobs registered in the service sector was maintained at the same level as in the Soviet era – almost 18,000 (2000). However, these jobs have lost much of their attraction and importance to the local economy. Deteriorating infrastructure and minimal wages, often paid in arrears, have led to an alarming erosion of public services. This has been felt especially in the health and education sectors. The private service sector is gaining momentum, but is currently dependent largely on general economic performance, and is far from becoming a driving force in economic development.

Diversification of industrial production, maintenance of public services, and strengthening of the private service sector all appear to be needed. The creation of new jobs would also make it easier to tackle the problem of unemployment, which has long been one of the most serious problems in the Pamir Mountains. The total number of jobs registered in all economic sectors has been almost halved over the

After Tajik independence, local markets experienced a revival, replacing closed state-run shops. It was the first time that local products were sold, as opposed to giving surpluses away free of charge. (Photo: P. Sieber)



last seven years. Despite extensive restructuring of the state sector, the *oblast* remains the most important employer in the region. The shock of the drastic reduction in jobs was partially compensated by a steady growth in the number of people working in the informal sector, and by the fact that many people have returned to self-sufficient forms of agriculture.

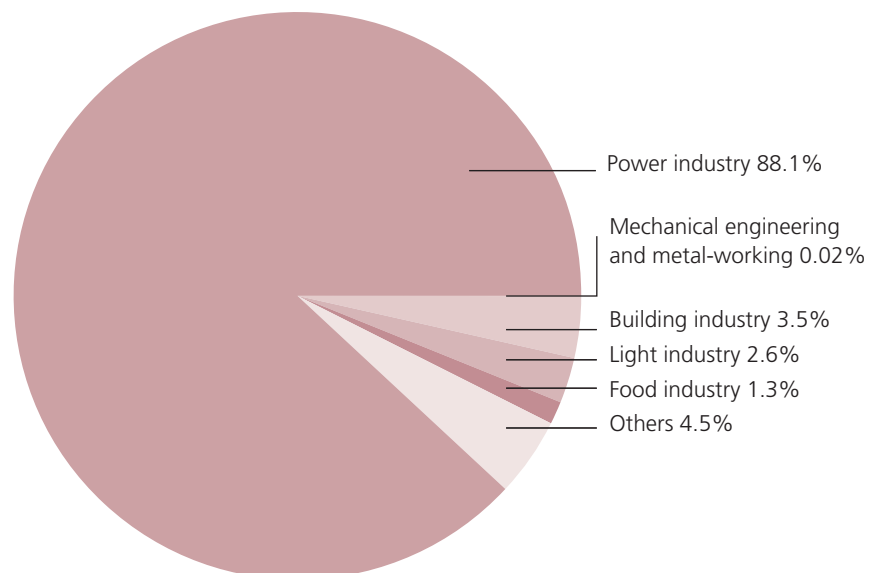
Diversification and regional integration

With a limited potential to increase agricultural production, development options in the secondary and tertiary sectors represent the most promising ways of strengthening the local economy. Such options need to make use of those resources in the region that have remained largely unexploited to date. This includes processing and refinement of local raw materials in the region, and fuller exploitation of geographic particularities. The region has an obvious potential for many types of tourist activities. The strategic location and relative remoteness of the Tajik Pamirs need not be an obstacle to economic development. The GBAO

could also serve as a bridge to facilitate exchange in the region between China, Afghanistan, Kyrgyzstan and Pakistan. These assets and opportunities, coupled with the comparatively high level of education and the entrepreneurial spirit among much of the population, could be a good basis for economic development. But major obstacles remain: geographical remoteness and distance to markets in neighbouring areas hamper trade relations and have a negative influence on the region's competitiveness. Secondly, despite progressive attitudes towards new ideas and approaches, economic leaders have a regional, isolationist attitude and a tendency to stick to traditional schemes. A major challenge, particu-

larly for political leaders, is to further develop the legal framework and law enforcement mechanisms required to support the business environment.

In all likelihood, better regional integration and diversification of economic options in the Tajik Pamirs will be the key to future economic development. It was the greatly revered Aga Khan IV who demonstrated that improved regional integration appears to be a more beneficial strategy than continuing to view the region as a secluded unit cut off from the rest of the world by its peripheral location. Economic and political integration at a supra-regional level are inseparably linked. This assessment can also be understood as an appeal to formerly antagonistic republics for political rapprochement, which often lags behind economic rapprochement.



Revenue generated by each branch of the industrial sector in Gorno Badakshan for the year 2000. (Source: Islomkhuja 2002)



Switchboard in Murgab, serving an area the size of Switzerland. Although over 50 years old, the switchboard is still functioning. However, its reliability and transmission quality are rapidly decreasing and do not even meet minimal standards. (Photo: A. Haslinger)



Properly planned micro-hydropower stations are a cost-efficient and environmentally friendly source of electricity for remote villages. (Photo: D. Zibung)

AN ECONOMY IN TRANSITION

Infrastructure

Daniel Zibung

Infrastructure for production, such as communication, energy and transport facilities, is a key issue in sustainable development. All three types of infrastructure are essential for the development of mountain areas in general and of the Tajik Pamirs in particular. From an economic point of view, such in-frastructure is a prerequisite for highly functional production and hence for the creation of local income. From a regional perspective, these facilities are the basis for vital linkages between Gorno Badakhshan and adjacent regions and urban areas; they help to overcome the relative remoteness of the Tajik Pamirs and improve living conditions for its inhabitants.

Transport

Transport is a key factor in development. This is particularly true for Gorno Badakhshan, given its geographical seclusion and sensitive strategic location, resulting in very limited links with neighbouring countries. Currently there are few possibilities to access the GBAO. By road the Tajik Pamirs can either be reached from Dushanbe or from Osh, while Khorog is served by air from Dushanbe. Other options for access,

such as entering Badakhshan from Afghanistan, are barely developed and serve local needs almost exclusively or have not been opened up, like the connection to the Karakorum Highway from China.

Distance and the reliability of the routes are more important than the number of options where accessibility to the GBAO is concerned. The Pamir Highway, built between 1932 and 1940, stretches 524 km from Khorog to Dushanbe, and 728 km to Osh, requiring a minimum of two days by lorry. While high altitude in the Eastern Pamirs poses a difficulty, with 3 passes over 4000 meters, in the Western Pamirs the problem is the topography, characterized by often steep and narrow valleys and thus making roads more vulnerable to natural hazards. In addition, flight connections to and from the GBAO are affected by mountainous conditions. Often leading through narrow canyons, the air route is served only when weather conditions are good. This leads to frequent cancellation of scheduled flights; some weeks the GBAO cannot be reached by plane at all.

The Pamir Highway (M41) is the backbone of the GBAO's 3600 km road network. Of this, 1500 km have been classified as national and regional roads. Characteristically, these roads have asphalt or gravel surfaces and are primarily parts of the M41 or connections to district capitals. The remaining 2100 km of roads are mostly rural, serving smaller settlements or linking valleys. Road conditions vary greatly, but in general they are far from minimal international standards. The Soviet road network

was not regularly maintained in the last decade and its condition has deteriorated greatly. As a result access to the GBAO became less reliable and more time-consuming, resulting in increasingly higher transport costs. To improve access to the GBAO, the Pamir Highway over the Kulma Pass is now linked to the Karakorum Highway. Once bilateral treaties are adopted, this new connection could boost trade relations with China or even provide access to Pakistan's markets and harbours.

Information and communication technology

Information and communication facilities such as telephone, television and radio, and computer-based technologies like the Internet, are important catalysts that can trigger development in mountain regions. The GBAO communication infrastructure provided by the Soviet Union was comparatively well developed and available to much of the population. Following Tajik independence, communication facilities were barely maintained and technical equipment deteriorated. In parts of the region affected by the civil war, many phone lines and switchboards were destroyed, resulting in poor service and operational availability.

The GBAO region has approximately 12,000 telephones. With an average of 65 phones per 1000 persons, telecommunication services are at a higher level here than in the rest of Tajikistan. However, telecom-

The GBAO has inherited a comparatively dense road network. Maintenance and improvement of existing transport infrastructure exceed the budgetary possibilities of local administrative units.
(Photo: D. Maselli)



munication infrastructure for both Tajikistan and the GBAO is below the average in developing countries.¹ The extensive area of the *oblast*, its rough topography, and low population density with relatively widespread settlements pose challenges for provision and maintenance of an adequate telephone network in the GBAO. Phone lines in the GBAO are not suitable for Internet connections. Thanks to a private aid organization, it is possible to send and receive e-mails, at least in Khorog.

Postal services are another important part of communication infrastructure. Remote regions such as the GBAO are served by air or road, depending on the weather. Within the GBAO, services are provided once a week by car and even by horse in isolated areas. Domestic mail delivery takes 7–10 days, whereas international mail may take up to one or two months. The quality and reliability of the postal services is a cause of repeated complaints. Besides delivering and sending letters, the postal system also includes other services such as domestic money transfers. However, it appears virtually impossible for people abroad to send money to the GBAO to support families left behind, although this service could compensate for the barely developed banking sector. By contrast, the GBAO is very well served by radio and TV broadcasts, and a high percentage of households have a TV set.

Electric power

Electrification of the GBAO and neighbouring countries began in the 1940s, with the construction of the first hydroelectric plant. Up to the 1990s hydropower generation was continuously extended and a considerable number of diesel electric power stations were also in operation. The current energy infrastructure in the GBAO consists of a few small hydroelectric plants, two of which – Pamir I (14 MW) and Khorog (7.5 MW) – account for 70 percent of available capacity. Recently programmes have been instituted to upgrade and expand the hydropower infrastructure, in order to compensate for decreasing and unreliable production of power in the GBAO.

Due to its remoteness and rugged topography, the GBAO is not linked to the Tajik electric grid. Even within the GBAO there is no existing grid link. Several smaller grids are linked to a local power plant supplying the surrounding area. The transmission system as a whole is in very poor condition; only about 15 percent is still in service. Although an almost universal electricity grid was built in Pamiri villages, today 43 percent of GBAO villages have no electricity during winter, and 10 percent have no electricity at any time during the year, despite “enjoying” a connection to the grid.² As a response to the decline in production of diesel energy and the degraded transmission system, the AKF and the MSDSP implemented a programme to promote mini hydropower stations. From 1994 to 2001, 21 such micro hydropower stations were built on GBAO territory, serving more than 19,000 beneficiaries. When properly planned, micro hydroelectric plants are highly efficient in serving local energy needs in mountain areas.

Setting priorities

By comparison with other mountain areas in socialist or developing countries, the GBAO's infrastructure has attained an exceptional level of quantity and quality. However, this once highly subsidised infrastructure, servicing even the remotest villages, will probably never be self-supporting. The challenge for the future will be to secure a functioning infrastructure at affordable prices, to provide a basis for economic development. However, careful setting of priorities, including the abandonment of existing parts of the current infrastructure, is a necessity that requires the involvement of all stakeholders.

1 <http://www.worldbank.org> 2002.

2 *The World Bank, Project Appraisal Document 'Pamir Private Power Project', 2002, p. 11.*



Although close to extinction, the snow leopard and other endangered wildlife are still poached. Only combined efforts by national and international agencies to prevent illegal trade can be effective. (Photo: J. Hangartner)

THE NATURAL ENVIRONMENT AND ITS POTENTIAL

High mountain areas: a wildlife habitat

Cristina Boschi, Andrea Haslinger, Riccarda Lüthi, Bernhard Nievergelt

The Pamirs are renowned for their unique biodiversity and have long been a focus of special interest for scientists. Few animals are adapted to the extreme habitat of this arid high-mountain region (see table below). On the whole, the diversity of the fauna in the Pamirs is rather limited, with only 20 species of mammals. There is a complete absence of insectivores and bats, which cannot survive in these severe climatic conditions (Kuznetsov, 1948). Given the limited opportunities available to the Pamiri people to meet daily needs and generate income, exploitation of wildlife resources is an eco-

nomically necessary. Wildlife is currently a source of meat for local people and of trophies for foreign hunters (WWF 2002).

The deteriorating economic situation in the wake of the transition in Tajikistan and the introduction of trophy hunting have led to an overall increase in pressure on wildlife in the Tajik Pamirs. The Marco Polo Sheep (*Ovis ammon polii*) and Siberian ibex (*Capra [ibex] sibirica*), whose habitats are in the

Eastern Pamirs, are particularly affected. The status of the Marco Polo sheep, which is found on several lists of endangered or threatened species, is a focus of major discussions regarding the sustainable use of wildlife resources.

Marco Polo sheep and Siberian ibex

The survival of the Marco Polo sheep is of particular importance, as it can be considered practically endemic to the Tajik Pamirs, the small Wakhan Corridor of Afghanistan, the Pamir region of China, and possibly Hunza in Pakistan. Census data indicate a drastic decrease in the Marco Polo sheep population within the last 30 years, and even the population figures from the 1970s

| Species | | Estimated number (WWF) | Red List category (Krever) |
|--------------------------|---|------------------------|----------------------------------|
| Eastern Pamir | | | |
| Ruddy shelduck | <i>Tadorna ferruginea</i> | 700–900 | – |
| Mountain or Indian goose | <i>Anser indicus</i> | 490 | Vulnerable |
| Himalayan snowcock | <i>Tetraogallus himalayensis himalayensis</i> | 2,000–2,800 | – |
| Tibetan snowcock | <i>Tetraogallus tibetanus tibetanus</i> | 90–100 | Vulnerable |
| Tibetan sandgrouse | <i>Syrrhaptes tibetanus</i> | 140–150 | Critically endangered/endangered |
| Golden eagle | <i>Aquila chrysaetos</i> | No data available | Vulnerable |
| Bearded vulture | <i>Gypaetus barbatus</i> | No data available | Vulnerable |
| Himalayan griffon | <i>Gyps himalayensis</i> | No data available | Vulnerable |
| Saker falcon | <i>Falco cherrug milvipes</i> | No data available | Endangered |
| Siberian ibex | <i>Capra ibex sibirica</i> | 12,000–13,000 | – |
| Marco Polo sheep | <i>Ovis ammon polii</i> | 3,000–14,550 | Vulnerable |
| GBAO | | | |
| Tolai hare | <i>Lepus tolai pamirensis</i> | 2,500–4,000 | – |
| Long-tailed marmot | <i>Marmota caudata</i> | 250,000 | – |
| Pamir fox | <i>Vulpes vulpes pamirensis</i> | 1,200–1,300 | – |
| Wolf | <i>Canis lupus desertorum</i> | 180–200 | – |
| Tien Shan brown bear | <i>Ursus arctos isabellinus</i> | 10–12 | Vulnerable |
| Central Asian otter | <i>Lutra lutra seistanica</i> | No data available | Vulnerable |
| Turkestan lynx | <i>Lynx lynx isabellinus</i> | 20–25 | Endangered |
| Snow leopard | <i>Uncia uncia</i> | 180–200 | Vulnerable |



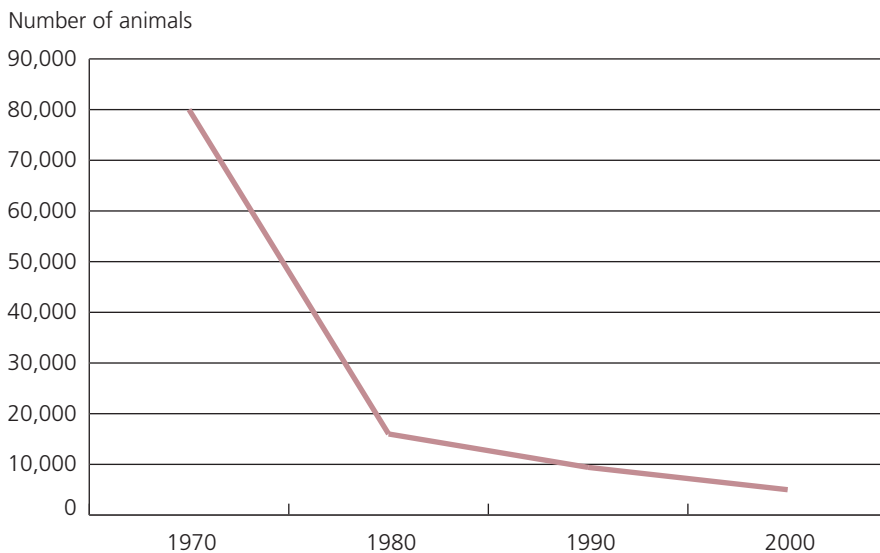
The Siberian ibex – a source of revenue in the tourism sector – is not a threatened species, unlike the Marco Polo sheep. (Photo: R. Middleton, AKDN)

appear to be exaggerated. The species is variously found on several lists of vulnerable, threatened and endangered species. Figures on the current population in the Tajik Pamirs range from 3000 to 14,550 animals, depending on the census methods and seasons. According to Prof. O. Aknazarov, Director of the Pamir Biological Institute, the total number of Marco Polo sheep at present is likely to be at the lower end of the above estimates, with a population of

The status of the much more widespread Siberian ibex is described as not threatened, although most populations face the risk of being severely reduced or even eradicated in many parts of their range (Shackleton/ IUCN 1997). According to estimates by the WWF, about 12,000–13,000 ibexes lived in the Eastern Pamirs in the year 2002. Wildlife in the Pamirs, particularly larger mammals (marmots, hares, snow leopards, Siberian ibex, Marco Polo sheep,

currency, although to a much lesser extent. No more than 80 tourist hunting licences are granted per season for Marco Polo sheep (WWF 2002). Corresponding numbers for the Siberian ibex are lacking. Although the number of animals shot for trophies is far below the number shot for their meat, the effects of any type of hunting on the animal population must be considered with regard to sustainable use of this valuable resource (Shackleton/IUCN 1997).

The effect of hunting is seen not only in the decrease in wildlife population. Studies carried out at two sites in the Eastern Pamirs indicate that wild ungulates also respond to disturbance in terms of spatial and social behaviour. They retreat towards less accessible ranges with poorer vegetation and steeper slopes. They also switch to nocturnal activity, showing a less regular diurnal pattern, and live in smaller groups. Great hunting pressure also affects their behaviour when escaping. Alarmed animals run further away and disappear once they notice an intruder, while with less hunting pressure they soon return to their grazing and resting activities. Habitats are lost as a result, as observed at the test sites where Marco Polo sheep were excluded from optimal feeding grounds. Such enforced habitat change normally results in lower limits on population growth and negatively affects the physical condition of the animals.



Population of Marco Polo sheep in Tajikistan. (Source: Shackleton/IUCN 1997 and Aknazarov 2002)

only 3000 to 5000 animals. Due to this species' economic importance, its status as a coveted trophy for sport hunters, its value of up to USD 35,000, and the fact that it is the focal point of diverging interests, population figures for the Marco Polo sheep are highly disputed. A comprehensive and independent census would probably be required for clarification.

etc.), are affected by (over-)hunting, interference from livestock and humans, and habitat degradation caused by livestock.

Hunting of wild ungulates

Although there is no doubt that hunting is the principal cause of the dramatic decrease in the population of wild ungulates, pressure from hunting varies in different areas of the Pamirs. Marco Polo sheep and Siberian ibexes are hunted mainly by local people and border patrol forces for meat in most regions close to settlements and roads. They are also threatened by legal sport hunting for hard

Livestock and wild ungulates – competition and co-existence

In the high mountain regions of the Eastern Pamirs, where economic opportunities are very limited, herding of yaks, sheep and goats is the most important source of income and is done intensively. Consequently, it is not surprising that there is



Domestic animals such as yaks (see photo) and sheep prefer the same grazing areas as most wild ungulates. However, there is no evidence that grazing competition alone is a major factor that has a negative impact on the wild ungulate population. (Photo: U. Lutz)

grazing competition on the small areas of good pastureland near the settlements, which are simultaneously typical wildlife habitats and ideal pastures for domestic animals. As a direct result, ungulates tend to shift their habitats to less disturbed areas at higher altitudes, on steeper slopes and in more remote areas. Such displacements to less suitable feeding grounds can have negative impacts on the condition and reproduction rates of wildlife populations.

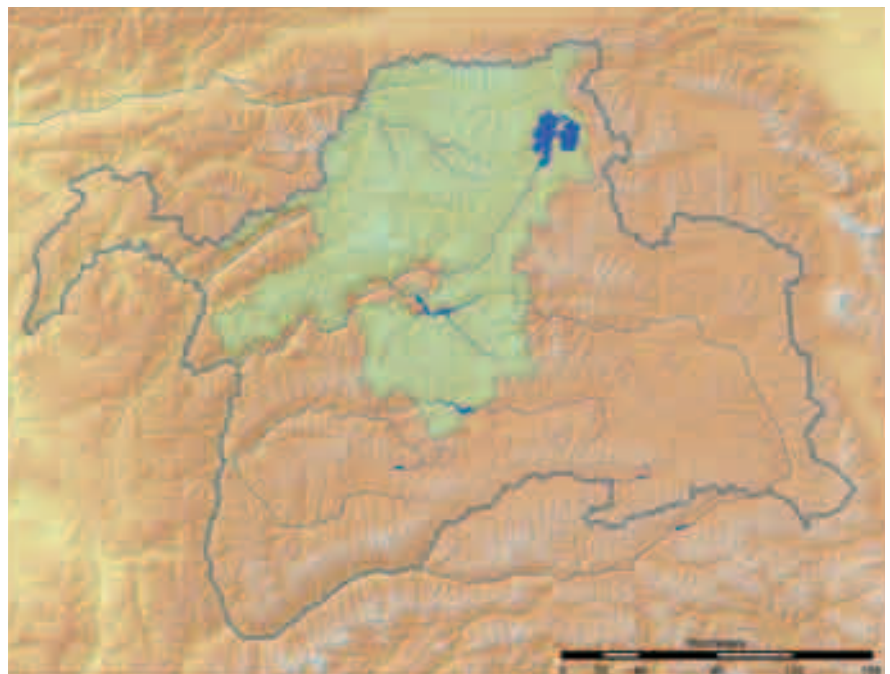
Indirect herding of domestic animals on rich feeding grounds in mountain valleys often results in changed behaviour patterns. In valleys with great and unpredictable hunting pressure, greater flight distance from herders, dogs and livestock was observed. The situation is different in areas with controlled and limited hunting. Here, it has been reported by locals that wildlife sometimes mixes with non-herded yaks while keeping a distance from sheep, which are almost always herded by a man, dog, or donkey to protect them against wolves.

In general, the impacts on wild herbivores from grazing competition with livestock do not seem to be a serious problem. However, competition should not be overlooked in summer pastures with unusually high sheep and goat stocking rates, as in the case of the Rankul area.

Probably more important for wild ungulates than grazing competition is the rapidly decreasing *teresken* plant. This dwarf shrub (*Ceratoides* spp.) is a valuable source of winter fodder for wildlife. The systematic gathering of this species by humans for use as fuelwood is having a negative impact on wild ungulate nutrition, particularly in winter. Animals can become susceptible to pronounced climatic conditions such as hard snow cover or extremely low temperatures. In summer, lack of *teresken* may reduce wildlife's capacity to accumulate fat reserves to survive the winter.

Combining conservation and economy

Given the limited options people in the Pamirs have to cover their daily needs, wildlife is an important additional resource. Among the various species, the Marco Polo sheep and the Siberian ibex play a crucial role, be it for food, hunting for sport, or wildlife observation safaris. The Marco Polo sheep, in particular, is a national asset that enjoys great international recognition. The reputation of this animal could stimulate international engagement in conservation projects and thus ultimately benefit other endangered species in the Pamir region as well. The strategies proposed below could be pursued to better meet the needs of the local population and protect the wildlife population, particularly the Marco Polo sheep and the Siberian ibex.



Location and extent of the Tajik National Park in the GBAO in 2002. The sections of the park outside the boundaries of the GBAO are not shown. (Source: Landuse Department GBAO, Khorog)

Local specialists and hunters at a workshop in Murgab. Compiling information about local conditions is a prerequisite for assessing the dynamics of habitat change.
(Photo: C. Boschi)



Basic data on the Tajik National Park

| | |
|--------------|---|
| Mode: | Established in 1992 as National Park. Plans exist to include the Park as a Biosphere Reserve in UNESCO's Man and Biosphere (MAB) Programme and to enlarge its boundaries into neighbouring Kyrgyzstan to create an international transboundary protected area. |
| Location: | Mountain ranges in the northern part of Gorno Badakhshan Autonomous Oblast (GBAO), including the former Zakazniks, 'Muzkolski' and 'Pamirski' |
| Ecosystems: | In its southern part around Lake Sarez, the park includes unique, virtually undisturbed mountains; in the western part, mountain and forest landscape with rich fauna; in the eastern part mountain deserts, alpine meadows, and cushion flora; and in the northern part huge glaciers and rocky slopes |
| Current use: | 14% of the area is used for agriculture; the remaining 86% consist of rocks, glaciers, snowfields and steep slopes. Two percent of the agricultural land is cultivated and 98% is used as rangeland (Badenkov and Buzurukov 1993) |
| Population: | 2000–2500 Pamiri (Mountain Tajiks) and Kyrgyz people live inside the park |
| Size: | 2.05 million ha (2/3 of the area of the Tajik Pamirs) within the GBAO |
| Objectives: | <ul style="list-style-type: none"> • Conservation of intact ecosystems, unique and various landscapes, flora and fauna, and historical and cultural monuments • Promotion of sustainable use of natural resources, tourism, environmental education, conservation of national traditions, improvement of living conditions • Realisation of research (botany, zoology, recreational resources) and restoration of natural, historical and cultural resources |

Breeding of wild ungulates

Marco Polo sheep and Siberian ibexes are well adapted to environmental conditions in the Pamirs. Both species can be kept in captivity due to their social system and natural grouping patterns: clearly visible age and sex classes (horn size, body size, etc.) promote a clear and stable social hierarchy. The high-quality meat of the Marco Polo sheep and Siberian ibex represents a further possibility for generating income.

The Marco Polo sheep and Siberian ibex are traditionalists in terms of spatial behaviour: they remain within their traditionally used areas. Therefore, immediate return into areas where they have been exterminated cannot be expected. Marco Polo sheep and Siberian ibexes bred on farms could serve as a breeding nucleus and be introduced in vacant areas. Introduction of such wild but habituated ungulates could also be an advantage in tourist areas: their shorter flight distance would facilitate wildlife observation.

Basic data on the Tajik National Park. (Source: Haslinger 2003)

Trophy hunting

As mentioned above, the Marco Polo sheep is one of the most valued trophy animals worldwide and hence a promising source of income. This fact can be taken as an invitation to institutions in Tajikistan to develop a system in which hard currency sport hunting in particular evolves into a dependable resource for financing needed conservation measures. Particular attention is necessary to ensure that an increased share of revenues find their way to local

communities and that local people are fully integrated in the decision-making and allocation process. To achieve this, it will first be necessary to improve the decision-making basis. Given the uncertain character of data on wild ungulates (and other wildlife), the first step should be to establish a monitoring system. Secondly, since wildlife cannot be regarded as a hunting resource only, hunting by local people and tourists should be controlled and limited to a certain time of the year in specific areas, and be based on rules of sustainable wildlife management.

Protected areas

Protected areas in Tajikistan are intended for maintenance of ecological balance, preservation of biological diversity, and collection of scientific information and data on interactions between humans and the environment. Currently three protected areas exist within the GBAO, covering an area of 27,500 km². Besides the huge Tajik National Park, Tajikistan has established the Zorkul Reserve near the Wakhan Corridor and the Muzkol Sanctuary. However, all three protected areas are still in the process of becoming operational or are still in the planning phase. Minimal available funding is currently a major limiting factor for effective

A typical valley to be included in the Tajik National Park. Ecosystem conservation must ultimately be undertaken in cooperation with the local population and offer the benefit of improved living conditions. (Photo: J. Schneider)



tive implementation of park concepts. Once operational and provided with a modern zoning concept, these parks covering more than 50 percent of the Tajik Pamirs will greatly enhance the sustainable use of wildlife resources and could even become exemplary models of park management in similar mountain areas.

The Tajik National Park

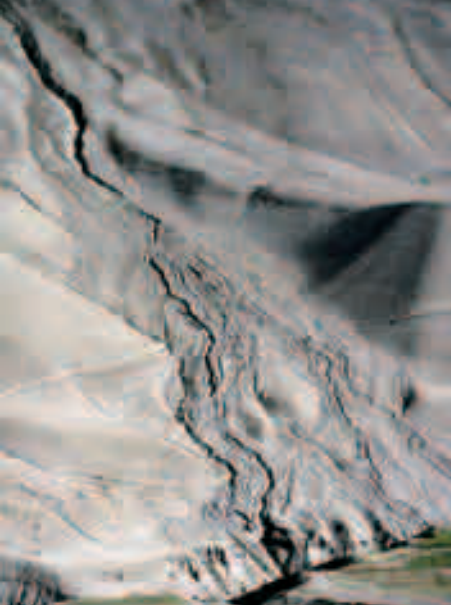
To raise awareness among the local population of the Pamirs about conservation matters and sustainable use of natural resources, it is important to create alternative sources of income outside the dominant farming sector. The Tajik National Park presents a feasible option for meeting this requirement and thus minimising the pressure of exploitation on natural resources and ecosystems in the Pamir Mountains. For example, Marco Polo sheep could be an outstanding attraction in the Tajik National Park: given protection from hunting, these large mammals will learn to accept humans and thus be easily observable (Geist 1971).

Income from controlled hunting in defined areas could help finance infrastructure (and management) of the park. Therefore the experience of local experts with ecosystem management should be enhanced through adequate training and equipment.

The huge protected mountain area could become a Biosphere Reserve that includes not only the barren high mountain areas of the Eastern Pamirs but also the densely populated, rich but threatened ecosystems in the western foothills, thus conserving the rich biodiversity that could

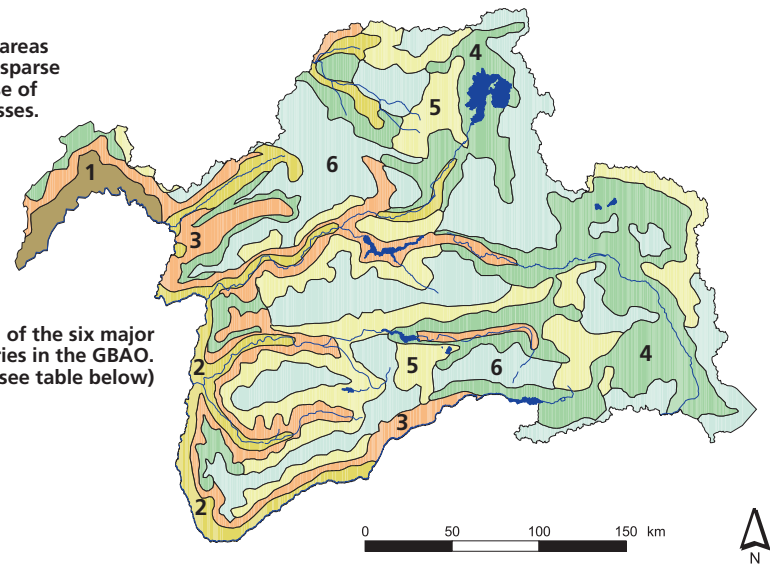
serve as a basis for further development.¹ Appropriate zoning and management of the park area would allow for a combination of protection measures, research, tourism, and sustainable use of fauna and flora. The park could be used for ecological educational purposes by raising awareness of the value and potential of the environment, as well as awareness of environmental threats. The involvement of local people in the decision-making process and in obtaining benefits will be a key element in implementation.

¹ Within the framework of its Global Mountain Partnership Programme (GMPP), the United Nations University (UNU) is currently developing a programme entitled "Sustainable Management of Natural Resources in the High Pamir and Pamir–Alai Mountains: An Integrated and Transboundary Initiative for Biodiversity Conservation and Mountain Development in Central Asia", with the aim of contributing to this vision (see Hurni and Jansky 2001).



Geological conditions in vast areas of the Pamirs combined with sparse vegetation cover are the cause of various natural erosive processes. (Photo: P. Sieber)

Distribution of the six major ecosystem categories in the GBAO. (Legend: see table below)



THE NATURAL ENVIRONMENT AND ITS POTENTIAL

Ecosystems and land resources

Christian Hergarten

Due to extreme climatic and geomorphological conditions, vegetation types in the Pamirs are extremely specialised. Given the physical conditions in the Pamirs, it is not surprising that resources such as vegetation, soils and wildlife are particularly vul-

nerable to any outside influence. Only through well-adapted and careful resource utilization practices can the Pamirs remain the home of an intact and productive ecosystem that provides a basis for sustainable livelihood systems.

| Ecosystem type | Characteristics/importance | Prominent plants (examples) |
|---|---|---|
| 1 Mountain xerophytic light forest ecosystems (pistachio forests) | Dry, warm; small areas of the lower-lying western foothills of the Pamirs regulate surface runoff and serve as habitats for wild animals. | <i>Hordeum spontaneum</i> (wild relatives of barley), <i>Vicia tenuifolia</i> , <i>Amygdalus bucharica</i> (almond), <i>Diospyros lotus</i> (persimmon), <i>Zizyphus jujuba</i> (jujube), <i>Punica granatum</i> (pomegranate), <i>Vitis vinifera</i> (grape) |
| 2 Mountain mesophyllic forest ecosystems (maple-walnut/willow-poplar-birch forests) | These skirt the low-lying riversides of the Western Pamir (including Mesophyllic shrubs) | <i>Juglans regia</i> (walnut), <i>Acer turkestanicum</i> (maple), <i>Betula tianschanica</i> (birch) |
| 3 Mountain coniferous forest ecosystems (small area in the Western Pamir) | Crucial for regulation/conservation of water resources (protecting steep slopes/reinforcing river banks) | <i>Juniperus</i> spp. |
| 4 High mountain meadow-steppe ecosystems | High biomass production; typical of the Eastern Pamirs | <i>Festuca altaica</i> , <i>Stipa kirghisorum</i> (feather grass), <i>Poa alpina</i> (meadow grass), <i>Carex melanantha</i> , <i>C. stenocarpa</i> (sedges), <i>Cobresia stenocarpa</i> , <i>Oxytropis savellanica</i> , <i>Thymus seravschanicus</i> |
| 5 High mountain nival desert ecosystems | Very cold, little precipitation, high rate of evaporation (sublimation) | <i>Ceratoides</i> spp. (teresken), <i>Artemisia pamirica</i> , <i>A. Korshinskyi</i> (wormwood), <i>Ajania tibetica</i> , <i>Stipa glareos</i> (feather grass), <i>Oxytropis immerse</i> , <i>Acantholimon diaspenioides</i> |
| 6 High mountain nival-glacial ecosystems | Very cold, rocky, frequent ice and snow | <i>Melandrium apelatam</i> , <i>Draba altaica</i> (whitlow grass), <i>Astragalus</i> spp. (milk vetch), <i>Saussurea glacialis</i> |

The six major ecosystem categories in the GBAO (see also map above).

Vegetation types

According to modern sources, the flora of the GBAO is composed of 2200 species of higher plants. Due to different microclimatic conditions resulting in different exposition, precipitation, slope inclination and soil composition, vegetation habitats are not distributed evenly throughout the Pamirs. Generally, the vegetation line is higher towards the centre of the mountain range. The ecosystems of the Pamirs can be subdivided into six major categories (see table and map).

Land resources for agricultural use

Fragile ecosystems are endangered by intensified land use as a result of agricultural transformation and limited options for increasing the amount of arable land. In the Western Pamirs, the amount of arable land is currently about 24,000 ha,¹ which is roughly equal to 0.4% of the total area of the GBAO, or less than 0.12 ha per capita. Arable areas often have bright brown soils and are mainly located on alluvial fans in the deeply incised mountain valleys. In the Eastern Pamirs, high mountain desert soils predominate, allowing only very extensive forms of land use such as cattle grazing. The total area of pastureland is roughly estimated at about 7730 km² and little of the area with mountain steppe soils along meandering rivers can be used for fodder production.

Irrigation agriculture

Almost all arable land in the Western Pamirs is irrigated, owing to high evaporation rates and minimal rainfall during the summer. Irrigation agriculture can be found up to 3700 m. In general, however, soil quality and production are significantly



Proper planning and regular maintenance of irrigation systems are labour-intensive. Inappropriate schemes can lead to declining soil fertility, while leaking irrigation channels can trigger mudflows. (Photo: J. Schneider)



The forests in the Tajik Pamirs have almost completely disappeared over the last centuries, with only a few – frequently inaccessible – patches remaining today. (Photo: E. Kleinn)

reduced at these altitudes. Most of the fertile soils in valleys have developed under the influence of the diverse and highly threatened ecosystems of the Western Pamirs, such as the *tugai* forests.

Considerable efforts are being made to increase the yields from all crops. New species have been distributed to local farmers, and training courses in farming are being held for new and inexperienced farmers. These efforts have resulted in sharp increases in productivity and decreased dependence on food aid. But intensification has also led to the degradation of agricultural land, and signs of declining fertility are becoming obvious.

Agricultural techniques play a major role in preventing land degradation. Farmers seem to be aware of conservation practices such as crop rotation, fallow, contour ploughing, and cultivation of legumes for nitrogen fixation. However, they are often not in a position to apply such measures regularly, owing to immediate production needs or lack of funds. Soil fertility on agricultural land is gradually decreasing, especially as people use cattle dung for cooking and heating in winter. Chemical fertilisers do not appear to be a viable option, owing to their high price.

About 1000 ha of arable land have been reclaimed in the Western Pamirs during the last 2 years, aside from land used for intensified agriculture. However, such new areas are often very prone to degradation and must be observed carefully. The widely used practice of flood irrigation is an important trigger for wash-out processes, which sometimes result in gully erosion.

In general, both new and old irrigation systems have turned out to be key factors affecting both ecosystems and livelihoods in the Western Pamirs: most irrigation channels and systems have low levels of efficiency. Moreover, they are often built or carved underground on steep, unstable slopes, and leaking is a widespread phenomenon. It is quite common for these irri-

gation channels to destabilise slopes and trigger mudflows that pose a direct threat to settlements and cultivated areas.

Land resources in the Eastern Pamirs

Desert plains, steppes on high altitudes, and a harsh climate with little rainfall to alleviate desertification processes are the main bio-physical characteristics in the Eastern Pamirs.

Desertification processes have accelerated as a result of the prevailing large-scale pasturing in the past. As a result, high-mountain meadow plant communities were gradually replaced by inferior thorny herbs and desert herbs. The very shallow alpine desert soils of the pasture areas are highly prone to deflation and changes in protective vegetation. With the decrease in coal imports over the last decade, *teresken*, a slow-growing shrub, has been used on a large scale by locals for heating and cooking. As a result, soil depth has been reduced, desertification triggered, and the resource base that supports wildlife and domestic animals has decreased.

Small patches of high mountain meadow-steppe are found on pastureland, often in valleys with meandering rivers. Such meadows have much higher rates of fodder productivity. Even the soils are less subject to degradation, as they are consolidated by dense turf vegetation, while grazing intensity, particularly in the vicinity of settlements, is increasingly leading to deterioration of meadows.

Conservation and economic development

The major challenge to the ecosystem in the Pamir will be to strike a balance between protecting sensitive and limited agricultural land and meeting the livelihood needs of the local population.

In terms of immediate steps to preserve fragile natural resources, technical measures to relieve pressure on local fuel resources, such as the search for alternative sources of energy, will be essential. This could include reforestation of appropriate areas and effective protection of the last remaining forest patches in the Tajik Pamirs. The question of irrigation will have to be addressed by indirect measures that help to increase production and thus ease pressure on existing resources. Proper planning of new irrigation schemes and the rehabilitation, maintenance and appropriate operation of existing systems will be a necessity. Production that is more market-oriented and taps natural local potentials in a sustainable manner could also be an opportunity for development. The measures indicated above would certainly benefit from appropriate legislation that provides incentives and an enabling climate for investment.

Efforts that aim to preserve or restore natural resources cannot rely only on the measures described here. Synergies with other sectors of the economy will also need to be created in the long run. The chances for success will depend largely on considerable improvement of the economic situation at the community level.

1 <http://www.grida.no/enrin/htmls/tadjik/soe2001/eng/htmls/landuse/tables.htm> plus 1000ha new land (MSDSP).

2 <http://www.grida.no/enrin/htmls/tadjik/soe/soils/soils3.htm>

Sources:

State Committee of Statistics, Tajikistan (2002)
Oshurbekov (2001)
NABU (2001)



Mountain lakes such as Lake Sarez offer the greatest potential for large-scale generation of hydropower. But inaccessibility and the need for high levels of investment pose obstacles to realisation of this potential, at least in the short and medium term. (Photo: J. Schneider)

The hydropower station in Khorog. In the absence of a regional grid and markets, the economic viability of large power plants is limited. (Photo: D. Zibung)



THE NATURAL ENVIRONMENT AND ITS POTENTIAL

Energy: a precondition for development

Daniel Zibung

The remote and exposed location of Gorno Badakhshan, combined with the loss of coal and diesel subsidies after the disintegration of the Soviet Union, led to a considerable shortage of energy resources in the GBAO. As a result, local fuel resources such as firewood and dung are being seriously overexploited. Enforced utilisation of the abundant hydro resources and other renewable energy sources, as well as exploitation of local coal deposits, could be solutions to the current shortage of energy and help save the remaining tree cover.

The energy situation

During the Soviet era, the GBAO region was provided with energy at very low prices, and there was even an excess supply of energy. Much of the overall demand was met by fossil energy sources. With the disintegration of the Soviet Union, fuel deliveries abruptly came to a halt. Coal has not been available since 1990, and the supply of diesel fuel has decreased significantly.

Energy sources

Local estimates show that energy consumption dropped to 3.6 million Giga Joule (GJ) in the year 2000, representing a reduction of almost 20% compared to 1990. This is equivalent to a per capita consumption of 17,400 Mega Joule (MJ), compared with 18,100 MJ for Tajikistan as a whole. Today approximately 80% of the demand for energy is covered by wood, shrubs and dung, whereas diesel plays a subordinate role. As the second most important form of energy, electricity meets about 14% of energy needs.

These figures indicate that renewed exploitation of wood and dung partially compensated for the massive drop in fuel and coal consumption. Although fossil fuels accounted for more than 60% of total fuel consumption before 1991, overall consumption dropped only by 20%. Estimation of wood use, based on household surveys, indicates an annual consumption of 1.4 million GJ, which resulted in a 70% decline in wood resources in the past 10 years. Most recent estimates indicate that firewood consumption is even higher in local households.¹ While *teresken* is the primary source of fuelwood in higher areas of the GBAO, fruit trees are often burned in lower regions in the Western Pamirs.

Energy production

Although there have been major efforts to promote electricity, overall consumption has never exceeded 13%. Electricity production in the GBAO began in the 1940s and increased year by year. In the 1950s hydropower production was supplemented with decentralised diesel electricity production for smaller grids, reaching a peak in 1989, with 154.8 million kilowatt-hour (kWh). With the decline of diesel in 1991, electricity production dropped sharply to only 78.7 million kWh by 1993. With the opening of the Pamir I power plant in 1994, this trend was reversed, but local isolated grids received no benefit from this improvement.

Electricity consumption

112 million kWh of the total of 136.8 million kWh produced, or 86.1%, is directly consumed by the population, with heating requiring enormous amounts of electricity. This results in a total of 3700 kWh per household annually (the comparable figure for Switzerland is 2650 kWh). This quantity of available electricity should be enough to cover needs for cooking and lighting, and probably for heating a minimum of one room per house. To achieve self-sufficiency in the energy sector and generate income in Gorno Badakhshan, however, it will be crucial to use a distinctly higher share of production for added value.

Hydro power potential

In the GBAO, with its snow- and glacier-fed rivers, the most important energy resource is hydropower, with a potential energy value of 1000–4000 Megawatt (MW). Lake Sarez represents the greatest potential for large-scale exploitation. Its natural dam, the great difference in altitude over a short distance and the large reservoir would permit relatively easy production of 100–200 MW. But the inaccessibility of the Sarez region and the current economic situation pose many difficulties, making such a project unrealistic.

Upgrading Pamir I and re-establishing the initial capacity of the existing power plants could raise the energy production capacity to 43 MW. Even with further optimising measures and an almost unlimited potential for micro-hydroelectric plants, it may not be possible to attain a capacity of much more than 45 MW.



Supplying electricity to remote mountain communities is a major issue. Here a self-made hydropower turbine supplies a household with electricity to provide light in Basid, Rushan District. (Photo: R. Middleton, AKDN)



Fuelwood and dried dung are used as substitutes for coal and diesel, which are no longer available locally. Alternatives must be developed in order to conserve rapidly decreasing firewood resources. (Photo: D. Maselli)

The construction of micro hydroelectric plants, if properly planned, seems to be the most economic way of securing a decentralised supply of electricity in the GBAO. Besides the construction of new plants, more efficient use of installed hydropower capacity could already improve the general electric power supply situation. In winter production of electricity is at its maximum, and limited by river discharge. It is expected that the enhancement of the Pamir I power plant will also relieve the winter supply bottleneck. By contrast, the potential for electricity production is unused, especially during the summer. The availability of this capacity could be tapped for increased industrial or handicraft production.

Energy resources

Regional coal deposits, solar energy and wind power are additional potential energy sources in the GBAO that should not be neglected. There are two known coal deposits on GBAO territory, one of which is at Ravnou in the region of Kalai-Khumb. The site is considered to have coal of quite good quality, with approved reserves of over 4.45 million tons. The second deposit is located in Chechtebe, but opinions are divided about the quality of its coal. The Chechtebe deposit is much smaller than the Ravnou deposit, with an estimated reserve of only 750,000 tons. Locally exploited coal could help to provide more energy for heating, simultaneously reducing pressure on tree cover and *teresken*.

There is considerable potential in solar and wind energy technologies, especially with low-cost and low-tech applications. These are largely passive solar technologies for use with improved isolation and optimised construction, such as windows directed to the south, double brickwork,

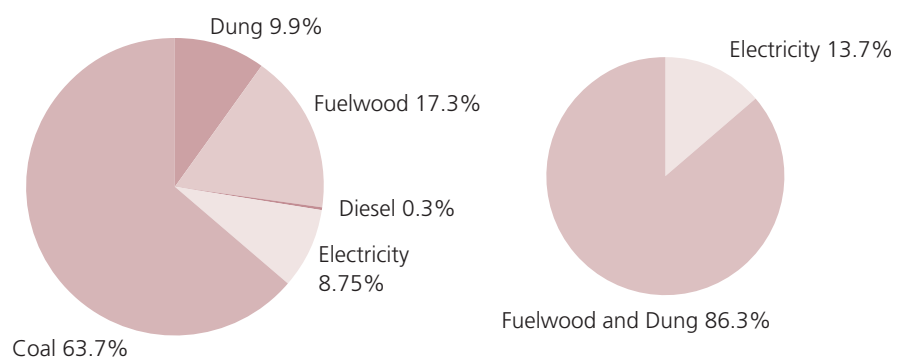
and only few small windows to the north. Passive solar technologies also include solar water heaters, solar cookers, and even greenhouses, which help to enhance production of foodstuffs. Wind energy may be used in the form of windmills driving pumps for irrigation. Although there is considerable potential even for active solar technologies and large-scale wind energy generation, the economic feasibility of these technologies is limited, due to the high investments and maintenance needed.

Combining different strategies

Only combined measures will succeed in improving the current energy situation, particularly with regard to rapidly deteriorating firewood resources.

In order to preserve local fuel sources from further deterioration, energy supply in rural areas will have to be significantly improved. In the short to medium term, exploitation of local coal deposits seems most promising. Combined with the promotion of micro hydropower stations and alternative energy forms, this can be expected to bring major improvements. The application of energy saving methods at the household level would surely be beneficial as well. In the long term, reforestation, with subsequent integrated forest management, could bring advantages not only with regard to energy supply but also to building materials and the stability of the natural environment.

1 Survey on the use of fuel resources on the territory of GBAO districts (GTZ CCD 2002).



Annual energy consumption in the GBAO: percentage covered by each energy prior source to 1990 and in 2000. (Source: PSP and Barki Tajik, 2001)

A massive earthquake in 1911 triggered a landslide, resulting in a natural dam 600 meters high, which created Lake Sarez. Today, the lake represents a permanent regional threat. (Photo: J. Schneider)



THE NATURAL ENVIRONMENT AND ITS POTENTIAL

The geological setting: hazards and potentials

Jean Schneider

The geologically complex area of Gorno Badakhshan is located in a zone of tectonic interaction among three major mountain structures: the Pamirs, the Hindukush and the Tien Shan. The Pamirs, in the bend of the highest mountain ridges of Central Asia, mark the northern edge of the Himalayas. This alpine orogenic belt, dating from the Cenozoic Age, was formed by the collision of the Indian subcontinent, drifting north-north-west, with Eurasia. This implies a shortening of the crust by more than 300 km, and a north-north-western displacement of the sedimentary strata of at least 200 km, owing to complex over-thrusting, folding and faulting. This tectonic reshaping of the crust and its sedimentary cover causes metamorphic alteration of buried rocks due to internal heat and pressure as well as hydrothermal activity. As a result, a variety of metallic and non-metallic mineral deposits are formed, some of which are of economic value.

Seismic activity

The present rate of convergence in the Pamirs is still approximately 2 cm per year. This tectonic activity is responsible for heavy seismic activity in Central Asia. Numerous earthquakes occur every year, particularly in the Pamirs. The main seismic

activity is connected to the west-south-west and to east-north-east bending faults created by this enormous crustal shortening and subduction. These structures are responsible for earthquake-induced events such as that at Karatag in 1907, Sarez in 1911, and Khait in 1949, with magnitudes of up to 7.4 on the Richter scale.

Dominant hazard types

Owing to their geography, with high plateaus in the east and deeply incised valleys in the west, the Pamir Mountains have considerable exposure to naturally induced geohazards. The population of the Western Pamirs settled mainly on alluvial fans in the lower parts of the narrow valleys, including the GBAO capital of Khorog. People, livelihoods and infrastructure are threatened by floods, mud and debris flows, avalanches, surges of pulsating glaciers, glacial lake outbursts, rockfalls, landslides, and earthquakes. The latter can also trigger mass movements.

The high plateaus in the eastern part of the Pamirs are exposed to strong winds and occasional tornados. The entire population of the Pamirs is used to snowstorms and avalanches in wintertime and regular flooding of valley floors due to snowmelt in springtime. Rockfalls and minor land and mudslides are common in spring or in the rainy season. Some of these threats are even human-induced, as a result of excessive irrigation, leaking channels, or undercutting of slopes. Generally, the sparsely populated areas in the Eastern Pamirs are less afflicted by natural hazards.

Lake Sarez – threat to an entire region

Large-scale threats are not easy to understand and therefore quite difficult to predict. The natural Usoi dam dates from 1911, when an earthquake with a magnitude of 7.4 on the Richter scale triggered a landslide from the right riverbank and buried a village. The water level is still rising in Lake Sarez. The lake is 60 km long, with a maximum depth of 500 metres. A large international mitigation project was initiated to reduce threats to the downstream population from possible overflowing, dam erosion, and dam breaks. It is assumed that collapse of the Usoi dam could cause devastation in the Amu Darya basin for a distance of 2000 km and affect more than 5 million people.

There are several other lakes formed by moraines or landslides in the Pamirs – some stable, others in a critical condition. This calls for investigation and careful observation (see also Alford et al. 2000).

Pulsating glaciers, glacial surges and glacial lake outbursts may play a greater role in the near future. Global warming seems to be responsible for a rising permafrost boundary. Former frozen rock and soil will be exposed to rapid erosion, resulting in the formation of mud and debris flows. This danger from remote high altitudes cannot be easily recognized by the population it threatens. The Dasht Dara is an example of such a disastrous debris flow. In the late summer of 2002, a glacial lake outburst in the highlands of the Roshtkala district of the GBAO resulted in a huge mudflow that caused 24 deaths and destroyed 40 households overnight. Similar glacial lakes need to be carefully observed in order to avoid similar disasters in the near future.

A coal pit in the Eastern Pamirs. Even though coal quality is rather low, this mine could help to partially relieve the pressure on fuelwood such as *teresken*. (Photo: P. Sieber)



Ruins of a house in Dasht, which was almost completely buried by a glacial lake outburst in the summer of 2002. Like many Pamiri villages, Dasht is built on an alluvial fan, and is particularly prone to recurring natural disasters. (Photo: J. Schneider)

Mining potential

Gorno Badakhshan has great mining potential in six mining districts: Iskashim, Rushan, Vanch and Kalai-Khumb in the west, and Alichur and Rangkul in the Eastern Pamirs. The deposits can be divided into three major groups: metallic ores, non-metallic mineral resources, and crystals/gemstones. Carbon and hydrocarbon deposits are almost absent in this area, except for the Ravnou coal deposit in the Kalai-khumb mining district.

The two sites considered to have the greatest mining potential¹ are the Dashtak decorative marble deposit in the Vanch mining district, which could feed the local market, and the Kukhilal noble spinel deposit in the Iskashim mining district, with a market potential at the global level. The Barch iron ore deposit in the Rushan mining district may be of some importance at the regional level.

The Rangkul mining district in the Eastern Pamirs, near the Chinese border, has some potential for placer gold in Rangkul, rubies in Snejnoye, and scapolite (a rare gemstone) in Kukurt. A rock salt deposit in Shorbel is of regional importance.

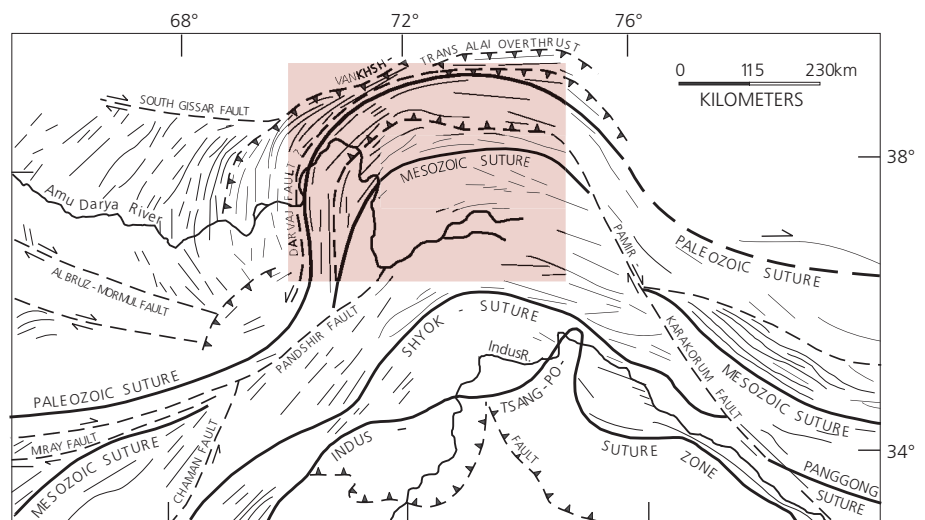
Less important occurrences of gemstones, crystals, gold, silver, copper, lead, zinc, titanium and iron ore are spread throughout the Pamirs, but high expectations for commercial-scale exploitation would be exaggerated.

Abundant raw materials, such as cement and concrete for construction of local roads and buildings, are an important and economically viable mining product. However, tapping this potential would require major investments in the energy sector and in measures to compensate for the difficult circumstances and limit the threat of natural hazards in the Pamirs.

Despite the considerable quality and quantity of some deposits, factors such as high elevation, the risk of natural hazards, low accessibility, and scarce energy or water resources reduce the economic viability of existing mineral deposits in the Pamirs. The high level of investment required for capacity building and develop-

ment of the mines, and the low potential for sale on the international markets reduce the chances of establishing a prosperous mining industry on a large scale. However, further small-scale exploitation, requiring low investments in proven and easily accessible resources, could contribute to the economic development of the Tajik Pamirs.

¹ Vladislav Minaev's ranking is based on Erova (2002).



Structural map of the Pamirian syntax, Tajik depression, and surrounding regions. The shaded area corresponds to map on page 11. (Redrawn after Burtman and Molnar, 1993)



Tavdem, a typical Pamiri village with 644 inhabitants in the Shakh dara valley, 20 km from Khorog. (Photo: C. Hergarten)

Community-building is an important part of the process of transition. Here, women assess needs in a group discussion in Basid. (Photo: M. Degen)



SOCIETY AND CULTURE IN TRANSITION

Livelihoods in rural areas

The following case studies of Basid, Tavdem and Kuna Kurgan attempt to highlight certain current aspects of daily life in typical villages in Gorno Badakhshan. The studies aim to illustrate the processes involved in changing socio-economic and political conditions at the local level during the first post-socialist decade. They depend on a participatory appraisal of natural conditions and dynamics, and on an assessment of household needs and coping strategies. This complex approach greatly enhanced insights into the potentials for future development at the village level, as well as obstacles to development.

The villages of Tavdem and Basid are situated in the Western Pamirs, at a height of about 2500 m, and are endowed with similar natural resources. About 600 people live mostly from irrigation agriculture in both villages. A third case study focused on the Kuna Kurgan *jamoat* in the Eastern Pamirs, which consists of five villages. The following sections summarise the comprehensive village development profiles done for Basid and Tavdem, and an exemplary study undertaken in Kuna Kurgan.

The villages of Basid and Tavdem

Muriel Degen

Basid and Tavdem have similar locations, comparable environmental features, and virtually the same number of inhabitants. In both villages arable land is irrigated, partly terraced, and located in the proximity of settlements. Quite large pasture areas and alpine meadows are used extensively in both villages for livestock herding in the summer.

Natural resources and land use

The forced intensification of agriculture has led to soil degradation. Soil erosion and widespread eluviation resulting from

inappropriate irrigation practices are particularly difficult problems that even lead to gully erosion on some of the steeper plots in Tavdem.

Arable land is also directly affected by a vicious cycle of energy needs. Most villages in the GBAO have faced serious energy shortages since supplies of coal, among others, ceased in 1991. In the current transition phase, people are forced to meet the demand for energy by exploiting alternative sources, such as fuelwood and dung cakes. The limited supply of fuelwood is rapidly decreasing, with the undesirable negative impact of declining soil fertility on arable land, resulting from reduced application of dung. The lack of organic compounds also has a negative impact on soil cohesion, eventually contributing to increased susceptibility to wind and water erosion (eolian deflation and eluviation).

Under current economic conditions, where people are forced to live on what they grow on their own land, they have virtually no financial means to supplement lost nutrients in the soil by buying chemical fertilisers. Hence the resource base becomes increasingly marginal.





Woman in Basid. Village economies in the GBAO have reverted to subsistence agriculture, and new household strategies must be found to improve the economic situation. (Photo: M. Degen)

From socialism to subsistence

Socio-economic conditions in Basid and Tavdem have been determined by reversion to an almost completely rural society since the breakdown of the Soviet system. As socio-economic transformation renders income generation more difficult, many villagers migrate to Dushanbe or Russia in order to support their families by sending home part of their salaries.

“When the sovkhoe was dissolved I lost my job. To live we had to sell our own possessions including animals, furniture and our car tires. To survive, many young people had to leave the village to find a job and send part of their salaries home. This, in turn, split up the families.”

Villager in Tavdem

Sudden dependency on own resources after a period of heavy subsidies during the Soviet era has left the region in despair. Villagers try to intensify agricultural productivity, as they are compelled to engage in subsistence farming. Their efforts are impeded by the limited amount of arable land, the rather poor quality of the soils, lack of funds for fertilisers, and a generally low level of knowledge about agricultural techniques.

Since the dissolution of the local *kolkhoze* and *sovkhoe* and the distribution of arable land, every family has cultivated an average 0.2 ha privately. Although the same amount of land was allocated to every villager, soil quality, distance between plots and houses, and the availability of water were not officially taken into consideration.

Furthermore, people are no longer accustomed to managing agricultural production themselves. During the Soviet era they were employees of the local *kolkhoze/sovkhoe*. Current circumstances have brought forth a new kind of solidarity.

Dietary adjustments

- reduce the number of meals
- send family members to relatives

Income generation strategies

- extend the variety and the size of kitchen gardens to improve vegetable and fruit yields
- produce handicrafts e.g. Pamiri socks to generate alternative income

Asset-depletion strategies

- sell livestock
- take children out of school
- sell household assets such as carpets, sewing machines, etc.

Informal safety net

- cultivate social networks in the village for day-to-day support
- migrate and send money home
- become a member of a local institution to gain access to informal networks and the benefits of lobbying

To secure their livelihoods, households develop strategies at different levels to improve their economic and social situation. (Degen 2002, Kanji and Gladwin 1999)

| Wealth group | Main source of income | Secondary source of income | Least important source of income |
|---|---|--|--|
| Well-off Tavdem 20% Basid 25% | <ul style="list-style-type: none"> • private enterprise • employment with an NGO • pension • family member working abroad | <ul style="list-style-type: none"> • agriculture • livestock | <ul style="list-style-type: none"> • kitchen garden |
| Constrained Tavdem 60% Basid 35% | <ul style="list-style-type: none"> • salary • pension • family member working abroad | <ul style="list-style-type: none"> • kitchen garden • livestock | |
| Struggling Tavdem 20% Basid 45% | <ul style="list-style-type: none"> • kitchen garden • selling milk • pension • herding | <ul style="list-style-type: none"> • help from relatives • collecting berries/wood | |

Household wealth rankings and typical sources of income.



Agriculture has become more intensive, despite a process of forced de-mechanisation. (Photo: D. Maselli)



The use of dung for fuel has greatly reduced the amount of fertilising on arable land. Chemical fertilisers are too expensive to afford. (Photo: D. Maselli)

“During Soviet times, the village was heavily supported by the Soviet system: consumer goods were available in state shops and social services were free of charge. Today we aren’t supported anymore by the government, those who are responsible for the district first look after themselves.”

Villager in Basid

Since the collapse of the Soviet system a certain social stratification has also become obvious. While the gap between rich and poor villagers was obscured under the communist principle of equality, it has become more visibly evident today. Wealth rankings based on indicators of differentiation assessed by the villagers show that only a quarter of the villagers have adapted to the new circumstances and are well-off, while 30% of the population in Tavdem and 45% in Basid are suffering from a lack of resources and know-how (see table on household wealth rankings). Poverty is widespread and the scope for action very limited.

From the perspective of households, humanitarian assistance is an absolutely necessary supplement to family agricultural produce. According to Kanji and Gladwin (1999), only 43% of the households in Gorno Badakhshan were able to cover their own nutritional needs in 1999. However, this number must be compared with agricultural productivity in the Soviet era, when only 15–20% of total requirements were produced in the Pamirs and most of the goods consumed daily were imported from other Soviet republics. Efforts are being made to intensify agricultural production, but limited natural resources do not allow for steady rates of growth.

The largely unemployed younger generation will have reason to stay in the Pamir region only if a certain level of professionalisation can be achieved and alternative sources of income are established to supplement the primary sector. Pamir society will not survive if economic activity is restricted to agriculture.

“If we knew how, we would leave the village immediately. But one has not enough money to migrate, the other has to look after his family with children, a third has elderly parents he can’t leave.”

A young villager in Basid

NGOs have begun several credit programmes that include the establishment of local savings groups and aim to advance the development of local micro-enterprises. These programmes try to impart some economic know-how to traders and businessmen/women, as adaptation to the new market system is still incomplete. In Basid and Tavdem a certain amount of shame about selling was observed. This is a relic of the communist principle of solidarity, and constitutes an impediment to business, especially among men, who are more fearful of their reputations than women.

“I don’t want to condemn the trade. On the one hand it’s good that traders make consumer goods available in the village, but on the other hand it is against my conviction to do business with my neighbours.”

Villager in Basid

Civil society

The impression of the social environment in the villages is one of a quite intact system of networks in clans and neighbourhoods, with reciprocal support and great dependence. In the past decade of transition, ties between people have become even more intense, and the small populations in the villages have developed a strong sense of solidarity within the community. But there are still families, mostly poor, who are disconnected from the villages and do not stay in contact with their relatives. Such families are still completely dependent on assistance. In this context the new social stratification becomes very obvious.

“The disappearance of the Soviet system changed our dependence on our relatives and neighbours: since we have to organise the ploughing, seeding, harvesting ourselves we are more dependent on the support of the neighbourhood. So we go back to old customs and traditions again, because it’s the only way to cultivate and to survive in the end. The collapse brought a more intense but also more economic form of solidarity.”

Villager in Tavdem

The Village Organisations (VOs) and women’s associations are community-building institutions. Against the background of the Soviet tradition of functioning institutions, the recent aim of the MSDSP to implement these new institutions at the local level faced no major obstacles. However, failed projects and problems in communicating with the MSDSP generated some scepticism about the abilities of the VOs, particularly in Basid.



The irrigation schedule is an ongoing issue in Tavdem. Farmers can irrigate only once in 12 days for a period of at least 5 hours, which results in water peaks unfavorable for the soils.
(Photo: C. Hergarten)

Decision-making concerned with village affairs is negotiated at the VO meetings, where different subgroups can introduce objectives and purposes, or comment on the work of the VO management by district. Experience in Tavdem and Basid shows that they are ideal places to promote participatory forms of interaction and thus support further development at the local level.

Needs

Sustainable regional development that aims to reduce dependence on humanitarian assistance can hardly be entirely endogenously driven. Development builds on two economic pillars: optimising local opportunity, and making use of possibilities outside the region, e.g. migrant work. Villages need financial resources generated by village inhabitants and foreign investment, and a policy that takes account of promotion of local knowledge and the local capacity for innovation, as well as technology transfer and know-how. The region also needs revenue to invest in local enterprise development, administration, and social services. To achieve increased agricultural production within the limits of sustainable management of natural resources, substitute energy sources must be found, agricultural areas expanded, and land use management adapted.

With respect to social development, analyses in Basid and Tavdem showed that there was little consensus about the priority of action in the fields of policy and administration. External moderators assigned high priority to needs in these sectors. However, there was agreement that parallel structures in government and in NGOs are not desirable. On the basis of the village studies, it is recommended that democratic principles be promoted to build the foun-

ation of regional administration and to ensure the participation of the population. In addition, community-building processes should be supported to connect disadvantaged families to networks and resources, and suspend the process of social stratification.

Development options

Diversification of sources of income would make people less dependent on subsistence production. The establishment of manufacturing enterprises and industries for wool processing, tailoring, food processing, leather production, etc., would be an important step towards a more balanced local economy in Basid and Tavdem.

Electricity is seen by local households as a prerequisite for future development. In particular, electricity generated by hydropower should support women in their daily housekeeping work, facilitate the establishment of processing shops, and be a substitute for firewood. Construction of the small local hydroelectric plant supported by the MSDSP was an important step. However, as the example of Basid shows, villagers need to be supported with regard to power station maintenance: three months after it had been built, the power station broke down and has not been repaired since.

An agricultural extension service could help meet the lack of know-how in individual farming on small agricultural plots. This would probably enable the villagers to intensify production and protect natural resources more professionally. Even if the populations of Basid and Tavdem do not become totally self-sufficient in nutrition in the next few years, the degree of self-subsistence could at least be increased and stabilised by intensifying cultivation to a reasonable extent.

Village overview: Basid

Altitude: 2440 m
Average annual temperature: 9.6°C
Average annual precipitation: 213 mm
Population: 587
Households: 104
Arable land per household: 0.2 hectare
Distance to centres:
 Rushan: 85 km (5 hours by bus)
 Khorog: 149 km (6 hours by bus)
Public infrastructure:
 Secondary school, hospital, *hukumat* (local government), radio station, post office, religious site, the *klub*, mills, small hydroelectric plant, security system for lake Sarez.
Institutions:
 Local institutions: *jamoat*, Village Organisation (VO), women's group, *shirkat* and Farmers' Association.
 Civil society organizations: MSDSP, Focus, Red Cross, PSF

Village overview: Tavdem

Altitude: 2460 m
Average temperature:
 January -16° to -12° C, July 16 to 20° C
Annual precipitation: 300 mm
Population: 644
Households: 104
Demography:
 0–15 years: 236 (37% of total population)
 >15 years: 408 (63% of total population)
Arable land per household: 0.19 hectare
Distance to centres:
 Khorog 20 km (40 minutes by car, daily bus connection available)
Public infrastructure: post office, hospital, medical aid station, small hydroelectric plant, secondary school, MSDSP warehouse, mill, religious site, and the *klub*.
Institutions:
 Local institutions: *jamoat*, Village Organisation (VO) and Farmers' Association.
 Civil society organizations: MSDSP, AKF, Red Cross



Murgab, a town founded in 1891 by the tsarist army is the political centre and the biggest market place of the Eastern Pamirs. (Photo: M. Domeisen)

In the summer months vegetables grown at an altitude of 3500 m can partially replace expensive imports from Osh. (Photo: M. Domeisen)



Kuna Kurgan

Michael Domeisen

Kuna Kurgan is one of five *jamoats* in the Tajik Eastern Pamirs. The region is characterised by large, dry plains at an average altitude between 3500 and 4000 m, intersected by mountain ranges reaching altitudes of 6000 m and more. Plant growth remains limited due to the lack of sufficient water – crops can barely be cultivated and must be imported across the passes of the Pamir Mountains.

“... it is a land where cold and storms prevail and pastureland is as poor and rare as nowhere else in the world.”

*Sven Hedin,
who travelled the Pamirs in 1889*

Natural resources and land use

The main natural resource is pastureland, with rich alpine meadows and shrub vegetation. Pastures are situated in valleys below glaciers (summer pasture) or along large rivers (winter pasture). Apart from livestock herding, winter fodder is cut where possible. The cultivation of both crops and legumes is barely possible and is done only in irrigated kitchen gardens. Recently, pastures near villages have been threatened by degradation because the cessation of high-altitude mobile herding has led to overuse of these areas.

When supplies of coal and electricity ceased, people were forced to collect and use *teresken*, a sub-shrub that serves as animal fodder and protects slopes from erosion. Local people and experts consider the harvesting of *teresken* to be the major recent ecological threat.

Other natural resources include thermal water sources and mineral deposits of coal, silver, gold, uranium and precious stones. These resources are currently used only in minor ways.

Livelihood in Kuna Kurgan

After the collapse of the Soviet Union, strategies for generating income shifted back to subsistence production. The keeping of several private sheep and yaks, originally in addition to paid labour, became the basis of livelihood for many families. Depending on household size, people received additional animals when privatisation took place in 1999. In Kuna Kurgan the average flock size today is only 10 sheep units per person. It is stressed by both herders and local livestock experts that more than 30 sheep units per person are needed to sustain a livelihood based on livestock breeding.

“Only about 2–5% of all herding households are able to live only from livestock breeding. The rest are forced to earn money elsewhere or depend on humanitarian aid.”

Chairman of Farmers' Association

Given harsh environmental conditions and isolation from markets located in the lowlands of Kyrgyzstan and China, alternative household strategies for generating urgently needed income are limited. Households that produce a surplus of dairy products sell parts of it on the local bazaar, reducing their own stocks for winter. On summer pastures children are occupied with collecting shrubs and dung that are sold on the market as fuel; hay is also sold as winter fodder. In general, strategies for securing household livelihoods are highly diversified within a larger network of social and kinship relations. The diversification of strategies to secure a livelihood, together with

the provision of flour by humanitarian aid organisations, has helped households to sustain their existence, even through years of drought and civil war.

The socio-economic situation

The most frequently mentioned aspect of the transformation process is the shift from a planned economy to a free market economy. This transformation is still not completed: rural regions in particular suffer from the collapse of economic structures of production and distribution of raw materials, capital and goods. The decline from full employment to an unemployment rate of more than 80% has been the most distressing change. In Kuna Kurgan today, more than 70% of all households are considered poor or very poor, and 95% are receiving humanitarian aid in the form of food and clothes.

Subsistence production covers about half of household income. The rest consists of humanitarian aid, the sale of animals and dairy products, hay, and *teresken*. Considering the need to buy flour – almost half of a family's expenses are for flour – the very low purchasing power of the local population is the most pressing problem.

“Every autumn we have to sell half of our flocks to buy flour that we need for winter.”

Poor herder on a summer pasture

Derelict infrastructure (roads, power plants, irrigation facilities), weak administrative structures, and isolation from markets are factors that aggravate the difficult socio-economic situation.

Cutting hay on a plain near Kuna Kurgan. The limited amount of winter fodder for yaks and sheep is one constraint that restricts the possibility of increasing herd size. (Photo: M. Domeisen)



The social environment and gender aspects

In general, a family is headed by a senior male member called *aksakal* (white beard). His tasks relate mainly to financial affairs and decision-making. Whenever possible, he joins the family at the *jailoo* (summer pasture), since according to Kyrgyz tradition, it is a sign of a household's social status to have one's own summer camp. While the head of an *übülö* (household) is not directly involved in hard daily work, female family members in particular have to bear the main burden of daily tasks such as milking, dairy production, cooking and housework. Children are mainly occupied with the herding of small ruminants and the collecting of fuel material. School is in session for only about 6–7 months a year.

“ We cannot afford to go to jailoo, but here the animals will not grow fat. If humanitarian aid stops there will be nobody left to help us.” 17-year-old mother

In general, rich and poor households are mainly distinguished by the size of their social network. Poor households are often marginalised and suffer from fewer relations with key persons – which makes their situation even worse. Despite bad socio-economic conditions in Kuna Kurgan, there has so far been no outmigration; the population is still growing considerably.

Needs

Local people emphasise the need to increase livestock as well as hay yield for winter forage. This demand will eventually require more mobile herding and the empowerment of institutions that are responsible for the regulation of access to land.

Another task is solving the energy problem. *Teresken* as a fuel must be partially replaced, and electricity supply restored, especially in view of the introduction of small-scale manufacturing industries. It will be crucial for future development to break through the isolation of the Kuna Kurgan region, re-activate market relations, and ensure fair terms of trade. Such development requires the enforcement of local administrative institutions, the rehabilitation of infrastructure, and access to information and education for households in all social classes.

Development options

The people of Kuna Kurgan underwent a sharp decline in their welfare and way of life after the collapse of the USSR. In order to achieve sound development planning at the community level, a multi-stakeholder negotiation process must be initiated. Livestock production will remain the backbone of the economy in Kuna Kurgan, and can also be an important contribution to the national economy. Improved livestock production is thus essential. Niche production of specific animals should be supported. The development of the internal market system is of paramount importance. Added value can be realised locally through the processing of goods produced at the local

level. Considerable investments in social and economic infrastructure are necessary. Combined with the development of the secondary and tertiary sectors, this could help to decrease dependency on the agricultural sector, and the integration of the various fields/sectors of economy could be enhanced.

Overview: Kuna Kurgan

Village altitude: 3650 m

Altitude of summer pastures: 3900–4500 m

Annual precipitation: 65 mm

Population: 1,027

Number of households: 235

Average household size: 4.4

Age distribution:

0–15: 41%

16–59: 50%

>59: 9%

Life expectancy: 52 years

Total area: 727,700 ha

Arable land: 400 ha

Pastureland: 78,792 ha

Distance to nearest town:

421 km (Osh, Kyrgyz Republic)

Ishpolkom, the Gorno Badakhshan Autonomous Oblast regional government building in Khorog, with a statue of Lenin in the foreground. (Photo: J.-L. Ray, AKDN).



Members of the Shirev (Darvaz) Village Organisation at a meeting. The Village Organisation programme mobilises human, physical and financial resources to empower local villagers. (Photo: J.-L. Ray, AKDN).



SOCIETY AND CULTURE IN TRANSITION

Towards pluralism: Challenges for governance and civil society

Thomas Breu and Hans Hurni

Historically, the population of Gorno Badakhshan has felt indebted to socialism, as instituted by Lenin, for enhancing their standard of living. At the same time, the political system imposed by the Soviets was much less accepted here than elsewhere. This may seem ironic in light of the fact that various authors have reported that the Tajik communist apparatus was closer to the population in Gorno Badakhshan than in other parts of the Soviet Union (Kuzmin, 2001). Abuse of political power was vociferously criticised, and the ruling political elites were accused of betraying the principles of communism. However, the high standard of living achieved in Gorno Badakhshan appears to have appeased political discontent and prevented it from having any real consequences.

The current political system

Based on its geographic location and distinct culture, Gorno Badakhshan has enjoyed a certain degree of autonomy since 1923. This was confirmed in 1995 after intense discussions at the national level by the Majlisi Oli (High Council). Today the government of the GBAO is made up of a number of state bodies directly subordinate to national authorities, and an *oblast* government that has the primary responsibility for coordination of public services provided directly to the local population.

The political system in the GBAO parallels the national political system. At the province (*oblast*) level, the executive is headed by the governor and 4 deputies. The governor is directly nominated by the Tajik President and heads the *oblast* administration with a staff of 40 persons. His duties are to implement the decisions made by the *majlisi* (council) of National Deputies (Province Deputies) and to enforce instructions from the Tajik Republic. A system similar to the one at the *oblast* level can be found in the 8 districts (including Khorog City, which has the same status), where district chairmen hold the executive power and district *majlis* the legislative power. At the local level, the so-called *jamoats*¹ are headed by a chairman and report directly to the district *hukumat* (administration). It is interesting to note that the president of the Tajik Republic also nominates the district chairmen directly.

Despite a certain amount of autonomy, which is clearly greater than that in the other Tajik provinces, key functions in the GBAO are controlled by the central government. In addition to nomination of local political leaders, the central government requires the different *oblast* authorities to report directly to corresponding national agencies. Among these are the Department of Finance, the Control and Inspection Department, the Department of Water Economy, the Military Commissariat, the Department of Electro Power Stations, the Pamir Auto Transport Department, the Road Construction Department, the Water Sewage System, the Department of Municipal Economy, and the juridical organs and intelligence services.

The juridical and security system of the GBAO is characterised by a relatively large number of offices reporting directly to the corresponding higher bodies at the national level. At the *oblast* and district levels, regional courts and a regional prosecutor are in place for both civil and military prosecutions. In addition, at the *oblast* level, economic cases are handled by a court. The security and information network consists of the KGB, the Directorate of Internal Affairs, the Ministry of Internal Affairs battalion, and the Drug Control Agency, all subordinated to the corresponding administrative units at the national level.

Administration and CSOs

In 1997 the administration of Gorno Badakhshan spent a total of USD 3.086 million for services, or USD 15 per capita. Most of the 1997 *oblast* budget was provided by financial transfers from the central government (93%), whereas the remaining 7% was local income from taxes and fees within Gorno Badakhshan. As one of the largest relief and development organisations, the AFK-affiliated Mountain Societies Development Support Programme (MSDSP) has an annual budget nearly identical to that of the GBAO administration (USD 2.4 million in 2001). Although exact calculations of expenditures by other NGOs and international organisations in the GBAO are not available, it can be stated that the state budget is several times smaller than expenditures made for development cooperation. With only a minimal budget, the *oblast* and

Under communist rule women enjoyed a high status in economic, familial and political affairs. An active role for women in the society and the economy will be essential for future development of the region. (Photo: D. Maselli)



district administration cannot fulfil typical state functions. Local civil society organizations (CSOs) provide not only humanitarian assistance but education and public health care as well. Moreover, the MSDSP provides ongoing support for the community-building process through its Village Organisation programme.

As a consequence, parts of the local population turned their backs on the official state bodies in favour of the CSOs and their institutions. Despite intensified cooperation between development organisations and state institutions, there remains a certain risk that a competitive dual system will evolve at the village level and negatively influence the capacity of the state to take action and assume liability.

Civil society and gender aspects

The sovietisation of Central Asia, while imposing a degree of communist orthodoxy, did not lead to the destruction of local culture and religion: the region was far from the centre of power and comprised a large number of rural communities where traditions remained strong. In addition, the government in Moscow found it politically advantageous to pay a certain amount of lip service to the concept of the the Soviet Union's "multicultural identity". However, with the breakdown of the Soviet-imposed system, the local political system was often paralysed, and no suitable institutions capable of coordinating and channelling local efforts were in place.

With the start of the humanitarian efforts undertaken by the agencies of the Aga Khan Development Network (AKDN), Village Organizations (VOs) were created in almost all villages by the MSDSP. Today there are more than 400 such organisations, with 45,000 members, extending to over 95% of the rural households in the GBAO. Initially established to facilitate the distribution of food aid, the VOs gradually shifted to a broader economic horizon concerned with more far-reaching activities than solely providing food aid and focusing on food self-sufficiency. Today the philosophy of the AKF and the MSDSP is that rural economic development is best catalysed and sustained through village-level institutions that are autonomous and transparent, and ultimately contribute to democracy. Against this background, decision-making on development-relevant village affairs is negotiated at VO meetings, where different subgroups can actively take part or comment on the management of the organisations. This kind of open dialogue fosters broad participation for development at the community level.

In phases of transition, gender aspects must be carefully observed, as fundamental transitions in society often disadvantage the female population (Kanji & Gladwin 1999). The combination of the rather liberal Ismaeli religion and communist principles of gender equality resulted in a comparatively high status for women. With the dissolution of the Soviet system, the position of women in economic, family and political affairs changed, frequently resulting in a diminished status. Women were the first to lose their jobs and other opportunities to earn income, and they have become more dependent on relatives during the recent decade. They have increasingly withdrawn to their homes and participate less in political affairs. To reverse this trend, the MSDSP

is making special efforts to enhance women's participation in the development process. A large number of micro-enterprise projects are being supported by numerous women's groups. These projects aim to increase women's income and their control over their own financial resources, and are intended to help women integrate themselves into emerging local markets.

¹ A jamoat, the smallest political entity, is composed of 5 to 20 villages. Currently Gorno Badakhshan has 45 registered jamoats in 8 districts (including Khorog City), comprising a total of 386 villages and towns.

Strongly motivated teachers are a precondition for maintaining high educational standards. Ongoing teacher training, adequate educational infrastructure, and higher salaries are a necessity. (Photo: P. Claquin, AKDN)



SOCIETY AND CULTURE IN TRANSITION

The search for new education and health services

Thomas Breu and Hans Hurni

Soviet rule brought substantial economic and social benefits for the Republics of Central Asia. Universal education and health services achieved levels of literacy and public health far superior to those in the former British Empire just across the Wakhan Corridor to the South. Subsidies from Moscow supported a standard of living and of education and health services that bore little relationship to the actual economic development of the region. Hence it is not surprising that these public services could not be sustained at their previous levels after the collapse of the Soviet Union. At the request of the local government, the Aga Khan Foundation (AKF) initiated a health programme in 1996 and an education programme in 1997 that are both still in effect at present.

The high value of education¹

The GBAO has very high educational standards and is renowned as the home of some of the leading scientists in Tajikistan and the states of the former Soviet Union. The literacy rate is almost 100%; education has always been highly valued. Children continued attending school even during the civil war after 1991.

Although negative trends in the education sector have been observed in the GBAO, education for girls as well as boys remains a very high priority. Drop-out rates are considerably lower than in many other regions of Tajikistan, with enrolment rates of 77% of school-age children in the GBAO as against a national average of 62%. Teachers continue to teach for minimal

salaries, and school administrators are finding ways to finance their schools with minimal financial support from the government. Despite this encouraging picture, there is evidence of an imminent decline in literacy rates and of a widening gap between girls and boys in relation to educational opportunity. School buildings with broken furniture, leaking roofs, broken windows, leaking pipes and no proper heating, electrical or sanitary facilities are in desperate need of rehabilitation. Essential supplies such as textbooks, notebooks, paper and chalk are lacking. Teachers' salaries have declined sharply, to only USD 5 to 8 per month, covering only 14% of the minimum cost of living. Teachers are often paid in arrears. Qualified teachers are forced to abandon teaching and turn to other income-generating activities or to emigrate, often leaving uncertified teachers with only grade 11 level education and limited teaching experience in charge of schools.

Structure of the educational sector

The educational system in the GBAO consists of 14 pre-school institutions, numerous public schools, and three tertiary institutions.

In the year 2000 Gorno Badakhshan had 318 public schools with a total of 55,000 pupils, which implies that almost all of the 386 villages still have their own school. Between 1990 and 2000 the total number of pupils increased by 11.5%, from 48,100 to 53,700. Population growth for the same time interval was 23%, indicating

that a growing proportion of school-age children cannot attend school or afford to buy the required school uniform. The total number of teachers grew at the same rate as the number of pupils (12%) and amounted to 6661 in 2000.²

In addition to elementary schools, the school system of the GBAO has a state university and two advanced technical colleges in Khorog. A distance learning programme was established to ensure that students from remote areas can benefit from the universities in Khorog. In 1999, a total of 3379 students were registered at the Khorog State University and at the two technical colleges. This amounts to 20 to 30% of all pupils who leave the compulsory schools. The Aga Khan Development Network (AKDN) recently announced plans to establish a University of Central Asia (UCA), with its main campus in Khorog. The UCA, which will also consist of affiliated universities to be established in Kyrgyzstan and Kazakhstan, will give specific attention in its curriculum to the different facets of sustainable economic and social development in mountain areas.

Needs of the educational sector

To ensure a well-functioning educational sector that provides the basis and the backbone for the future development of the GBAO, it will be necessary to invest in infrastructure, improve basic conditions for teachers, and reform teacher training.

Inadequate maintenance and the implications of the civil war in the north-western areas of the GBAO have caused considerable degradation of physical infrastructure. Estimates made by the AKF describe 60% of the school buildings as being in urgent need of repair; another 30 percent will require renovation within the next five years. Only 10% of the infrastructure appears to be in satisfactory condition.



Pharmacy in Roshtkala. Providing good health care is a real challenge, especially in remote areas. Training doctors and medical point nurses and delivering adequate supplies of drugs are the first steps in improving the situation.
(Photo: J.-L. Roy, AKDN)

People in remote mountain areas want to be linked to the modern world. Modern communication technologies allow the introduction of participatory teaching and learning at school. This can help stem migration to urban centres. Vanch.
(Photo: K. Bartlett, AKDN)



Higher salaries, paid regularly, must be secured as a prerequisite for a functioning educational sector. Only a substantial improvement in salaries will ensure that teachers are qualified and motivated. In addition, the reforms in teacher training, curriculum development, and education management initiated by the AKF education programme must continue and also be implemented at the district level.

Setting priorities in health care

Tajikistan's health system was developed under the Soviet Union. In the Soviet system, decisions concerning health issues were made by the central government and involved little or no consultation with regional counterparts. There was a surplus of health facilities and personnel, the focus of medical care was curative, and resources were spent in an excessive manner. The collapse of the Soviet Union left the health sector in the GBAO deprived of the extensive financial and material support it had enjoyed for decades. The public health system became highly dependent on external support, while there was a lack of basic health supplies and services as well as managerial expertise at the level of the regional Department of Health. As a result,

there was a sharp decline in medical services in the first years of independence, paving the way for a growing informal sector offering products and services of questionable quality.

The health system in the GBAO is characterised by a hierarchical structure from the village to the *oblast* level. In 1999, 34 hospitals with 2020 beds were operational throughout the GBAO. In addition to these local hospitals, 145 medical aid stations evenly distributed over the oblast and 29 ambulatory facilities were registered. The number of jobs in the health sector has not fluctuated much in recent years, although the number of physicians decreased by 10% between 1995 and 1999. However, the workforce in this sector is increasingly aged. Around 80% of the nearly 2000 jobs in the health sector are occupied by women and provide a small but important source of family income, particularly in rural areas.

In terms of quantity, with 9.8 beds per 100 inhabitants, the health system of Gorno Badakhshan can be compared with systems in Western countries. Although this statistic is basically positive, the high maintenance costs of such an extensive system of medical services cannot be borne by a marginal area such as the GBAO in the long run. With funding from international donors, the AKF is currently implementing

a programme focusing on the maintenance of medical aid stations, ambulatory facilities, and certain central hospital facilities in order to rehabilitate this vast infrastructure. However, most of the local hospitals in the districts will not receive any support from the programme and will probably be forced to close down.

In addition, the AKF health programme and the Department of Health are jointly implementing other measures aimed at transforming the health care system from a centrally planned, facility-based system into one that is decentralised, cost-effective and responsive to the local needs of the population in the GBAO.

Future challenges

The need to reorganise the structure of public health services poses an enormous challenge. In particular, the health and educational systems will have to undergo change and be established at an optimal size that can be sustained by the local government in the future. But change must be balanced, and also take into account the important socio-cultural functions these systems have in rural societies, the critical role they play in providing jobs and, last but not least, the fact that they provide a certain amount of money for rural economies.

Structure of the GBAO health system.
(Source: Zibung 2002)



- 1 Information on the educational sector is based on the AKF 'End of Grant Report for the Period 1999–2001' of the AKF Education Programme, 'Evaluation Report of AKF and ACTED Implemented Projects in GBAO' prepared by Rudolf Schoch on behalf of the Swiss Agency for Development and Cooperation (SDC) in 2001, and on a master's thesis by Daniel Zibung (PSP).
- 2 The figures presented in this section were obtained from the Statistical Department Khorog.
- 3 Information on the health sector is mainly based on Zibung (2002).

Transboundary trade today is almost exclusively geared towards imports into the GBAO. Balanced regional integration with the rest of Tajikistan and with neighbouring countries is expected to considerably further development.

(Photo: D. Maselli)



An appraisal of sustainability dimensions

Hans Hurni and Thomas Breu, based on a draft by Eva Ludi

The present account of the Tajik Pamirs and development trends in this remote high-mountain region allows to make an initial synthesis and evaluation of the overall situation in the GBAO, based on the general definition of sustainable development as “development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs” (WCED 1987). For practical reasons the definition is usually broken down into three major dimensions: social, ecological, and economic. The present appraisal is made from a primarily external perspective, using background information such as statistics, publications and maps, as presented in the previous chapters, as well as information gathered during field work undertaken by the PSP in 2001 and 2002.

The economic dimension of sustainable development

According to Harris (2000), “an economically sustainable system must be able to produce goods and services on a continuing basis to maintain manageable levels of government and external debt, and to avoid sectoral imbalances that damage agricultural or industrial production.” In the GBAO, it is difficult to imagine that an economically viable system has ever been in place, either now or in the past. Prior to Soviet occupation, the number of people living in the area was extremely low; subsistence agriculture was the main economic activity, and only a negligible percentage of household production was involved in

trade. Under these circumstances the sectoral imbalance favoured agriculture, while industry was non-existent, and the ‘service’ sector consisted of religious institutions and minor market exchange. During the Soviet era dependence on the rest of the Soviet empire increased tremendously with regard to supplies of energy, food and financial resources. A major external effort was required to develop a functioning transport and communication infrastructure, as well as health, education, culture and administration services, which eventually contributed to national security. Attractive family allowances and in-migration led to great population increase, although the total number of people was still relatively small compared to the size of the GBAO. The agricultural sector itself was totally transformed, from a subsistence-based household-centred system of production to a centrally organised commodity-oriented system. Employment in the primary sector decreased, at least as a percentage of the overall workforce, while more and more people were employed in other sectors. A few industrial settlements and different infrastructure projects contributed to the evolution of a modest secondary sector. The service sector, finally, was also developed at a modest level, while agriculture was specialised and thus required skilled labour.

Transition to a market economy

The economic situation today is still characterised by the transition period that began in 1991, when most activities collapsed or were considerably reoriented. The most dramatic change occurred in agriculture,

the primary sector, which returned to household-centred, subsistence-oriented production, thus absorbing many people who lost their government jobs. Of previously existing industrial sectors, the hydropower sector was virtually the only one to remain intact, and now constitutes the ‘backbone’ of the non-farm economy, small as it may be.

The current economy is thus highly underdeveloped; this is reflected by state revenues generated within the GBAO. As much as 93% of the budget of the *oblast* consists of direct transfers from the central Tajik government, while only 7% is locally generated through taxes and fees. International financial transfers from outside the GBAO into the region are dominated by technical cooperation and humanitarian aid, the volume of which has been much greater than government revenues since 1993, leading to a parallel system of government services, particularly in the fields of investment, maintenance of infrastructure, delivery of food, and health and educational services. The very modest current economic revenues are based on small-scale industries and manufacturing, which emerged only very recently. Nevertheless, this should be valued as a positive trend, as these activities are rather labour-intensive, and help diversify the economy while producing goods and providing jobs in response to local demand.

Agriculture and tourism today

The previous centrally organised livestock and fodder production system of the Soviet period has reverted to diversified, labour-intensive agriculture managed by individual households. This has been strongly supported by foreign technical cooperation, with the aim of reducing dependency on food aid. As a consequence of these efforts, self-sufficiency in crop production increased remarkably, to a level of about 70% within a period of a few years, from 1995 to 2000, and has since been maintained at that level.



Maintaining a high level of education is an important means of ensuring broad economic development in future.
(Photo: D. Maselli)

Major achievements have been made in diversifying and increasing agricultural production. Well-adapted management practices should be promoted to maintain the production base.
(Photo: D. Maselli)



Livestock production remained at a relatively low level, although here too traditional family summer pasturing systems were re-established, at least in areas more easily accessible by motorised transport. Especially in the western part of the GBAO, a more diversified land use system based on a combination of crop production in the valleys combined with livestock rearing developed.

Nonetheless, there are major shortcomings in sound development of the agrarian sector in the valleys of the Western Pamirs: a high level of subsistence orientation; the tiny proportion of irrigated plots; the low level of and low potential for mechanisation; household dependency on agrarian production, as other income sources are not available; decaying infrastructure; and the lack of agricultural knowledge on the part of many new farmers. In the highland areas of the Eastern Pamirs, where agriculture is limited to livestock production, the privatisation of herds has led to a household or family-based structure, although the number of animals per unit is insufficient to sustain a family.

The tourism sector is currently underdeveloped. Few foreign tourists visit the GBAO, and complicated, time-consuming entry requirements do not encourage growth in the number of visitors. Local and national tourism is more important, but on a very low economic level. Tourism infrastructure, finally, is almost non-existent apart from a few hotels in the main centres.

In conclusion, the economic situation in the GBAO today is far from viable. Income generation is inadequate, both for individual households and the local economy. Few jobs are available in the private sector. A

majority of those employed have jobs in government institutions (e.g. in the health and education sectors) or in government administration. The high rate of households dependent on food aid is a clear sign that the economic system is not functioning as it should. Markets are underdeveloped, especially markets for labour and capital. People have virtually no chance of finding other sources of income aside from individual farming, which is a clear indicator of the very low level of economic vitality.

Opportunities for economic development

Nevertheless, it should be noted that despite the state of the economy, trends have been positive at least since about 1995, showing very modest but increasing growth in the local economy. Certain economic assets and potentials hold out the hope of further improvement (see box), provided that major constraints can be overcome. The greatest opportunity appears to lie in rather positive geo-politi-

The economic dimensions of sustainable development: an appraisal of the assets, potentials and constraints of the GBAO in the Pamir Mountains

Assets:

- Existing international population networks (transregional and transboundary relations between the Ismaeli, Kyrgyz, and Tajik populations)
- High educational standards, offering highly skilled labour for technology development and industry
- Prevailing infrastructure in road networks, hydropower systems, schools, health facilities, and basic communication

Potentials:

- High relative productivity in relation to labour costs and skills
- Agricultural production for export (livestock markets, as well as cereals, horticulture and medicinal plant products)
- Energy production in the form of electricity for industrial and communication products
- High reliability of the labour force owing to good motivation and educational skills
- Mining potential (metallic and non-metallic minerals, cement industry)

Constraints:

- Weak and sometimes conflicting legislation, institutional rules and regulations that hinder sustainable development as a form of cooperation between institutions and stakeholders
- Fragile geo-political stability in neighbouring countries as well as other regions of Tajikistan
- Weak transboundary trade and market relations; difficult migration situation
- Lack of financial institutions and investment difficulties for outside firms
- Lack of high-tech skills in communication and service sectors
- Weak viability of hydropower system due to weak return on investment, as most electricity is used for subsistence household consumption (cooking, heating, light) instead of more efficient use in productive sectors (such as industry)



A rich cultural heritage and unique high mountain biodiversity, combined with numerous natural monuments, could provide the basis for different forms of tourism.
(Photo: E. Kleinn)

cal developments, such as peace-building in Afghanistan since 2002 and openings to neighbouring countries such as China, Kyrgyzstan, and perhaps Pakistan. The Pamir Mountains and the GBAO in particular suddenly find themselves in a situation where the opportunities of a crossroads region – in terms of market and technology development for agricultural and industrial production, as well as in exchange with neighbouring countries – are developing in a way similar to opportunities that existed in the past.

The social dimension of sustainable development

According to Harris (2000), “a socially sustainable system must achieve distributional equity, adequate provision of social services including health and education, gender equity, and political accountability and participation.” Two general indicators – growing social inequalities and impoverishment – are major characteristics of non-sustainability in the social sphere. Both can be observed in the GBAO up to the present day. Most jobs were lost during the transition period. Although privatisation of livestock and private use of land became possible, this did not increase social equity, because households and families had to return to self-sufficiency and subsistence economies based on very few heads of livestock and small plots of irrigable land. Most affected still are households headed by single individuals, or households forced to support family members in need, e.g. of medical treatment. Premature harvests of potatoes and crops are fairly usual for the most vulnerable households, where even a sound social network at community level cannot provide the necessary compensation. Nevertheless, within villages, distribu-

tional equity is fairly well guaranteed because of growing social networks, while great disparities exist between remote villages and the few centres in the region, where most economic growth is taking place.

Particularly affected groups

The transformation process has hit women especially hard. They were the first to be laid off. As a result, gender-based disparities within households and in society at large have increased, and the socio-political role of women has declined. A second group of people heavily affected are retired persons. Not only have pensions become minuscule, but they are paid only at irregular intervals. This places an additional burden on those families who have to care for retired people. The lack of employment opportunities leads to considerable out-migration, particularly among younger persons with higher levels of education. This has a negative effect on the educational level of current and future generations.

De-professionalisation of public institutions

Because salaries in government institutions, such as the education and health sectors, are far from sufficient to sustain a family, employees either migrate in search of better economic opportunities or are engaged in additional economic activities, thus neglecting their other duties. A further factor of importance at the social level is the weakening of administrative institutions because of the establishment of numerous parallel structures by non-governmental organisations (NGOs) to provide food aid and technical cooperation. Skilled labour was attracted due to much better salaries offered by NGOs; hence people left administrative positions for these newly-established organisations, thereby further weakening both the competence and the capacity of official institutions.

Limitations of the political system

In the political system, participation according to the principles of subsidiarity is a further requirement for sustainable social development. In the GBAO the process of local governance is being attempted to a certain degree only. While a regional government has been established at the level of the GBAO, a number of state bodies operational in the GBAO are subordinated directly to the national government bodies of Tajikistan. Thus they do not need to share in or support possible paths of development taken by the local authorities. The political system, as seen from an outsider’s perspective, appears rather complicated, with democracy realised to a certain degree only. Experience elsewhere shows that this leads to non-transparent decision-making mechanisms, thereby affecting the accountability of the political system vis-à-vis the sovereign, i.e. the population of the GBAO.

Opportunities for social development

With these general shortcomings in mind, one should nevertheless take stock of the numerous social assets and potentials possessed by the peoples of the Tajik Pamirs. These are listed in the box overleaf, and relate primarily to high educational standards, long-established and experienced conviviality, a unifying vision of the GBAO as an autonomous *oblast* shared by most people, and last but not least, the great ability of the population to survive under extremely difficult conditions. Networks and transboundary relationships offer a clear potential for social development, provided that persisting constraints such as engrained norms and attitudes can be loosened, democracy and local governance improved, and prevailing poverty overcome.



Pressing energy problems must be solved as a prerequisite for sustainable development. (Photo: E. Kleinn)



Adding value to the processing of local agricultural products could stimulate diversification of a lopsided economy. (Photo: J. Schneider)

Social dimension of sustainable development: an appraisal of the assets, potentials and constraints of the GBAO in the Pamir Mountains

Assets:

- High rates of school enrolment and levels of education among all population groups (Ismaeli, Kyrgyz, and Tajik)
- Traditional strong role of women in all spheres of life
- Great cultural diversity and long-established conviviality in relative peace and mutual complementarity
- A unifying vision of the GBAO as an autonomous region and an important unit of Tajikistan
- Great endurance and ability to survive under most difficult bio-physical and climatic conditions

Potentials:

- National and international family and ethnic networks suitable for exchange of goods, services, innovation, and financial support
- Transboundary relationships at the informal level suitable for peace-building and exchange of goods, services and information

Constraints:

- Weak and sometimes conflicting norms, values and social rules
- Weak democratic structure and traditions, and limited self-determination and local government accountability
- Widespread poverty hindering economic investment and consumption

Pamir Strategy Project

but not least, an extreme reduction in woody biomass has taken place since 1990 at the upper treeline, as woody biomass has become a substitute for coal that is no longer delivered at minimal costs for heating and cooking.

Another cause of environmental concern is overuse of pastures near villages, as this has led to accelerated degradation processes affecting soils and vegetation. The situation on winter pastures is especially dramatic, as animals are no longer exported before winter and have to survive on very scarce local fodder resources, since fodder imports are not affordable at the household level. There is a potential to enhance livestock numbers, but only if animals can be sold on local, regional, national or international markets, thus providing income for longer-distance transport of animals, for the purchase of fodder, and for veterinary services.

In the valleys of the Western Pamirs, the principles of sustainable land management have not been fulfilled either. While productivity per land unit, as well as total land area under irrigation, have been expanded to some extent, soil quality was not maintained in most locations due to a lack of good land husbandry. Soil erosion due to failures in irrigation management is widespread, sometimes enforced by erratic rainfall, snowmelt, or torrential runoff. Soil nutrient cycles, particularly nitrogen fixation and humus matter content, need more careful management in order to avoid nutrient mining.

Opportunities for ecological development

To counterbalance these negative observations about the ecological dimensions of development in the GBAO, it must be pointed out that better use could be made of a number of assets and potentials. One of the biggest assets is the water resource, the management of which needs continuous maintenance and care. Used for both energy generation and irrigation, water

The ecological dimension of sustainable development

According to Harris (2000), "an environmentally sustainable system must maintain a stable resource base, avoiding over-exploitation of renewable resource systems or environmental sink functions, and depleting non-renewable resources only to the extent that investment is made in adequate substitutes. This includes maintenance of biodiversity, atmospheric stability, and other ecosystem functions not ordinarily classified as economic resources." From this perspective, biological diversity in the GBAO has suffered greatly since the beginning not only of the transition period but much earlier, with the establishment of the centrally planned economy of the USSR.

Status and trends of ecosystems

In the Eastern Pamirs, important wildlife species such as the Marco Polo sheep, the snow leopard, and the Siberian ibex have been greatly reduced in numbers over the past 50 years, exceeding the threshold of sustainable use to the extent that extinction of the few species of larger mammals is now feared. The extreme poverty of the human population in the 1990s led to survival strategies that include increased hunting for meat. Moreover, illegal hunting for skins and trophies, in addition to the few official trophy hunting activities, have also increased pressure on wildlife. Income remained largely with national stakeholders rather than local community members. Last

Finding the optimal herd size, given the ecological carrying capacity, and diversifying income will be a challenge in the Eastern Pamirs. (Photo: A. Haslinger)



constitutes the backbone of the GBAO's economy and social system. In addition, the biological diversity of the Pamir Mountains offers the potential to attract tourism, invite selective and controlled hunting, and raise international support for conservation and protection, for the benefit of both the local and the global community. There are additional opportunities such as mining of minerals, hot springs, and gemstones, the exploitation of which should be carefully planned to the benefit of the whole population of the GBAO and not just for individuals, businesses or institutions. The potentials for sustainable use of natural resources are manifold, as listed in the box to the right. Constraints, nevertheless, are also important and should be considered, including people's belief that natural resources are unlimited and can be used accordingly. There is a need to substitute other sources of energy for woody biomass. Although difficult topography and climate, and the widespread occurrence of natural hazards that impede smooth economic and social development are factors typical of most mountain areas, they are especially pronounced in the Pamirs.

A concluding remark and outlook

There are many signals from all three dimensions of sustainable development that non-sustainability is widespread in the GBAO. Nevertheless, the situation does not appear to be insurmountable in view of the assets and clear potentials that exist in each dimension, provided that constraints can be overcome. General trends are less negative today than they were 5 years ago; steps taken in the immediate past have helped to improve the situation to some extent. Whether these will suffice to lead the GBAO to a viable economy, greater social equity, and ecological sustainability, is, however, questionable.

Setting priorities for infrastructure maintenance and making improvements where necessary will be a necessity. (Photo: E. Kleinn)



The ecological dimension of sustainable development: an appraisal of the assets, potentials and constraints of the GBAO in the Pamir Mountains

Assets:

- Exceptional habitats with relatively low but highly specific biological diversity and endemic properties
- Unique and rechargeable reservoirs of water in snow and ice, usable as melt-water for hydropower and irrigation in lower areas and lowlands
- Stunning and diversified landscapes for different forms of tourism
- Highly diverse climatic conditions and hot springs usable for recreation, healing and drinking
- Occurrence of minerals and gemstones, solar radiation, and wind for industrial and cultural uses

Potentials:

- Development of recreation and tourism (national, transboundary, and international)
- Productive use of hydropower energy for the development of economic sectors
- Development of water for irrigation, agriculture and livestock feed
- Sustainable use of wildlife resources for local income generation
- Protection of flora and fauna for global biological diversity preservation and local recreational use

Constraints:

- Widespread attitudes of local to national actors about "rational uses" of natural resources, meaning free access and non-sustainable exploitation
- Current use of woody biomass to substitute lack of fossil energy, and its over-exploitation to the point of extinction
- Difficult topographic and altitudinal situation for human existence and economic production
- Widespread occurrence of natural hazards and immediate threats to human population and economic infrastructure

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Some innovative steps need to be taken in an effort involving all stakeholders. As in all debates on sustainable development, a broad public process must be initiated to jointly elaborate on the various needs, options and constraints, and to develop a common vision and goals and a clear set of objectives for a strategy of sustainable mountain development. In Part III of this publication, this process, which was initiated by the PSP as a first step in October 2002, is documented in a set of strategic

objectives and an appraisal by the different stakeholder categories listed. The final outcome of the work is a proposal regarding how this process of strategy development can be encouraged through a step-wise approach and methodology, useful not only for the Pamir Mountains, but also for other marginal areas in mountains that face similar problems and enjoy similar potentials.

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part III

Towards a strategy
for sustainable
development





The city of Khorog, the administrative and economic centre of Gorno Badakhshan Autonomous Oblast, hosted the Pamir Strategy Workshop. At the time of the workshop in 2002, the city had just been linked to the Afghan Badakhshan region by a new bridge. (Photo: J. Schneider)

Negotiating strategy elements for sustainable development

Thomas Breu and Hans Hurni

Promoting sustainable development in mountain areas is a major political, economic, social and ecological challenge. This is especially true in areas like the Tajik Pamirs, which are currently undergoing a profound transformation process that affects society, the economy and the natural environment. As the most important step toward success, strategic elements and development priorities must be agreed on and supported by all stakeholder groups. With this in mind, the Pamir Strategy Project (PSP) organized a Workshop for Sustainable Development of the Tajik Pamirs, which was held in Khorog in October 2002. Within the framework of this workshop, knowledge was enhanced, problems and opportunities for sustainable development were highlighted, and strategic elements for the region's development were elaborated based on the stakeholder groups' visions. Joint appraisal of these elements enabled the stakeholder groups to agree on the importance and urgency of the selected development priorities.

The Pamir Strategy Workshop

Workshop objectives

To ensure a sound topical valuation and obtain a broad representation of actor groups, the PSP organised a four-day multi-level stakeholder workshop in Khorog. More than 80 participants representing various stakeholder groups, ranging from

communities to international organisations working in the fields of science, development cooperation and policy-making, took part in the Strategy Workshop for Sustainable Development of the Tajik Pamirs.

The aim of the workshop was to define the elements of a strategy for the sustainable development of the Tajik Pamirs and to provide a platform on which different stakeholders and disciplines could share knowledge about the status and dynamics of the Tajik Pamirs. Ultimately it is hoped that this multi-level negotiation will be the starting point for an ongoing process of participatory strategy development and implementation. As a prerequisite for this process, the information and knowledge on the current state, trends and mechanisms of the Tajik Pamirs, as presented in the preceding chapters, was compiled and analysed.

Approach and methodology

The multi-level stakeholder approach explained in detail on pages 65–69 was originally developed to determine feasible, viable and ecologically sound ways of promoting sustainable land management (SLM) at local levels. This calls for a stakeholder negotiation process that focuses equally on addressing the needs as well as the perceptions of the stakeholder levels involved. Following the declaration of Agenda 21 by the United Nations Conference on Environment and Development (Rio de Janeiro 1992), many international programmes began applying such participatory approaches either explicitly or implicitly. By definition stakeholders are interest groups or dependent groups who share a common interest in a certain region, in this case the Tajik Pamirs.

Since the multi-level stakeholder approach is an open and flexible concept, it was possible to adapt it to the requirements of the Strategy Workshop for Sustainable Development of the Tajik Pamirs. The workshop endeavoured to address themes relevant to the development of this particular mountain region. To this end, six strategic sectors were selected and five stakeholder levels defined. On the one hand, the various parallel sessions brought together specialists from different stakeholder levels. On the other hand, a balanced representation of the perceptions and preferences of the different stakeholder levels was ensured through the formulation of visions of sustainable development and an appraisal of the strategic elements. Through these interlinked processes the workshop exploited expert knowledge while at the same time adequately addressing the different stakeholder levels. As a result of this process, elements of a strategy were appraised in terms of importance and urgency of development priorities, and areas requiring further negotiation were made transparent.

Summary of workshop outcomes

Knowledge about the status and dynamics of the Tajik Pamirs was enhanced by involving both experts and stakeholders. In particular, awareness of the problems of, and opportunities for sustainable development in the region was raised. This included making visions of the different stakeholder levels explicit, elaborating strategic elements for the region's development, and negotiating a list of development priorities. Of the 18 strategic objectives, the following three achieved the highest ratings by all five stakeholder groups:



Breeding new varieties of cultivars using the genetic pool of the Tajik Pamirs could be a priority for applied research. (Photo: U. Lutz)

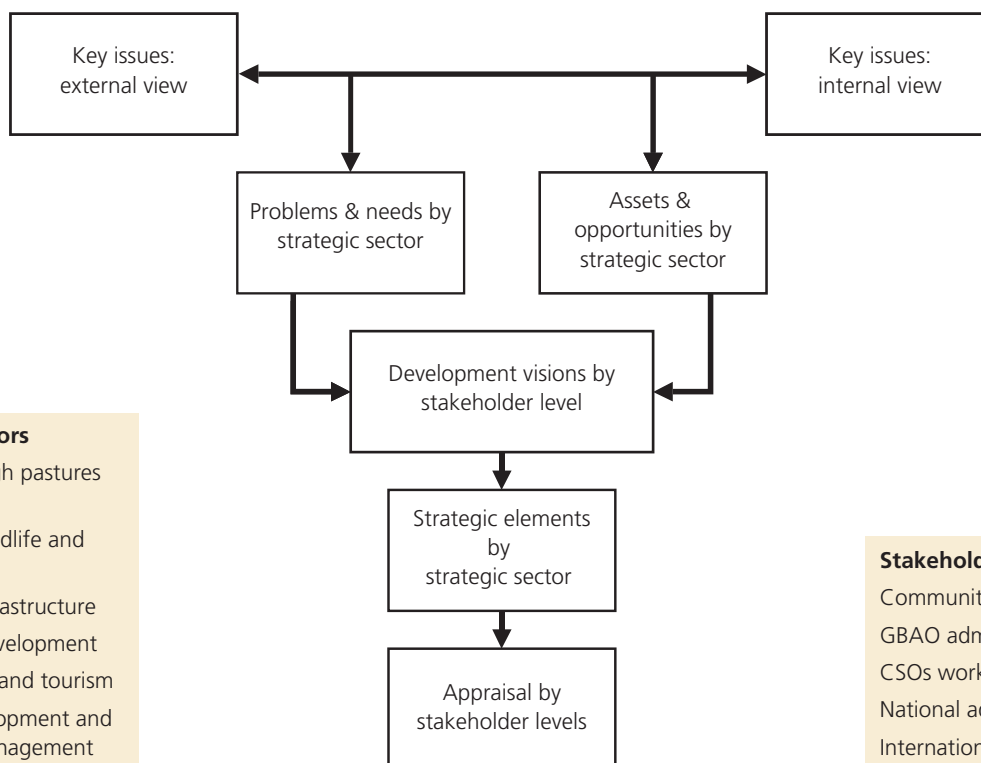
- Maintain energy facilities and increase energy production
- Reform/upgrade legislation and create favourable conditions
- Reanimate existing enterprises and create new ones on the basis of domestic natural resources

In addition to these clear and unanimously accepted objectives, a number of other objectives were rated in very different and even diverging ways. Such objectives will probably require further negotiation among the stakeholder groups.

Besides a wealth of information on development issues in the GBAO and insights on stakeholder perceptions and valuations of problems and potential solutions, the workshop also provided valuable methodological experience on multi-level negotiation processes between stakeholder groups. This experience can be transferred to participatory strategy development in other geographical and political contexts.

Generally speaking, feedback from workshop participants was highly positive. The participatory approach in particular, which brought together representatives from different stakeholder groups and disciplines, was deemed rewarding. In addition,

the methodology selected to prioritise objectives and accord equal weight to each stakeholder group found wide approval. The only major weakness of the workshop was the tight time frame, which impeded in-depth discussions and limited the negotiation process. Although the chosen participatory approach is based on a new concept, its application (probably for the first time) in a former Soviet Union state can be considered successful.



Strategic Sectors

- Agriculture, high pastures and irrigation
- Biodiversity, wildlife and conservation
- Energy and infrastructure
- Institutional development
- Industry, trade and tourism
- Research development and knowledge management

Stakeholder levels

- Communities
- GBAO administration
- CSOs working in the region
- National administration
- International organizations

Sequence of elements dealt with in the Strategy Workshop involving various stakeholder levels and addressing different strategy sectors. (Breu and Hurni 2003b)



Maintenance of the existing infrastructure and an increase in energy supplies were assigned high priority by all stakeholder groups. (Photo: D. Maselli)

Problems and opportunities by sector

The aims of the first session were to identify current problems and to list ways of overcoming them. Additionally the groups who participated in this session were asked to identify the actors affected and those who should take action to address these problems. The aim of the second thematic group work was to compile assets and opportunities for sustainable development in the Pamir mountains. In the second parallel session the groups endeavoured to identify potential beneficiaries in the event that these opportunities are developed, and discuss reasons why such opportunities have not been leveraged to date. The following section provides a brief summary of the group results achieved in the two parallel sessions.

Agriculture, high pastures and irrigation

The central problems in the agricultural sector were found to be the scarcity of arable land and the low productivity level of soils. Other important problems were poor melioration conditions, poor fodder bases, insufficient mechanisation, and an almost total lack of local processing units for agricultural products in the GBAO. Additionally, the absence of an accepted agricultural structure was deemed a major problem. Few problems in the field of high pasture management seem to have the same urgency and importance as the pressing issues in valley agriculture. In terms of (external) observations, degradation phenomena caused by intensive agriculture was perceived to be a core problem in this sector.

Measures and opportunities to increase total agricultural production were identified, with the potential to attract foreign investment for the reclamation of additional arable land, the cleaning and rehabilitation of existing irrigation systems, and the introduction of high-yield crop varieties to produce a second harvest. Opportunities in know-how transfer were also identified, e.g. through the introduction of technologies adapted from other mountainous regions and the revival of traditional agricultural technology. Emphasis was placed on the conditions governing the agricultural sector (market centres, melioration, agricultural structure, training, finances) and on the establishment of small processing units. In the group's opinion, the lack of funds was the obstacle to realising most of the outlined opportunities.

Biodiversity, wildlife and conservation

In view of the reported pressure on wildlife and fauna in the Tajik Pamirs, the group presented six major problems that can be divided into the following three categories: A) Economic: a low standard of living among much of the population and a scarcity of local energy resources, leading to overuse of woody biomass. B) Legal: neglect of existing laws and the inadequacy of nature conservation systems. C) Scientific: inadequate research into alpine biodiversity under changing conditions, along with a lack of studies on sustainable use of natural resources.

To address the energy problems identified, the group suggested developing and promoting alternative energy resources, and restoring depleted forests. To improve the system's weaknesses and promote efficient law enforcement, a set of measures ranging from education to improved organisation and financial support were proposed.

The opportunities identified by the wildlife group ranged from fish breeding, the exploitation of thermal energy, and a range of different tourist activities (sports hunting, photo- and eco-tourism), the breeding of rare insects, and cross-breeding experiments to improve domestic animals. Regarding the use of flora, the best chances were given to the establishment of commercial plantations for medicinal herbs, the enrichment of pastures with valuable plant species, and more efficient use of wild plants by the local population.

Energy and infrastructure

The group agreed that all infrastructure segments are faced with major problems, and that many of them are not in a position to meet the required standards. A total of ten major problems were named in three areas: In the communications sector, the condition of the telecoms system (including radio, television and postal services) and the poor condition of road infrastructure were cited. The second area named problems related to supply shortages and deteriorating energy infrastructures. Thirdly, the public infrastructure, comprising health, education and sanitation facilities was also seen as a major problem.

In order to tackle the problems in the telecommunications sector, ways of encouraging the state, the private sector and CSOs to make investments were proposed. Transport problems could initially be improved by the completion of the Murgab-Kulma-Karakorum and Khorog-Dushanbe highways. To address energy problems, the group believed that a concession agreement between the Republic of Tajikistan and the Pamirs Energy Compa-



Strategic objectives for the agricultural sector include land reclamation, intensified production, and the introduction of niche products. (Photo: D. Maselli)

ny would be an important step. In terms of public services, a major opportunity was perceived in the establishment of the main campus of the University of Central Asia in Khorog. The failure so far to take up proposals and leverage opportunities was attributed to the slow pace of reforms, funding difficulties, disrupted international links, and a lack of ideas and visions.

Institutional development

Two major problems were put forward by the group:

Firstly, institutional structures are unable to meet the demands of a changed economic system, while management staff lack sufficient knowledge and experience. The main factors hampering a smoothly functioning administration were found to be the working conditions of government employees and lack of incentives. Secondly, the legislation was criticised for its inability to address political and economic realities.

To overcome the problems outlined, a proposal was requested for a reorganised management system with a strong capacity building component. Furthermore, the *oblast* administration is to introduce a performance-oriented salary and incentive system. Deputies at all levels were called upon to exercise the right of initiative to update the current legislation.

One potential opportunity is for legislators to improve their image by initiating a process towards a law on sustainable mountain development that could boost production and provide the basis for livelihood support. A second opportunity was perceived in the reorganisation of local government units. The absence of favourable conditions for exchanging ideas and communicating deficiencies, coupled with difficult access to global expertise, were seen as obstacles to leveraging the opportunities identified in this sector.

Industry, trade and tourism

Weaknesses in electricity supply and the state of the telecommunications and transportation infrastructure were seen as the major obstacles to this sector's development. Additionally, problems in the banking sector and the implementation of existing tax laws were named. Inefficient use of local natural resources and the lack of coordination between industry and trade were also identified as major impediments to development. Besides improvements in legislation (banking sector and tax laws), upgrading the current infrastructure was cited as a prerequisite for the establishment of locally-based enterprises.

Industrial opportunities are seen in the production facilities that already exist, the availability of natural resources, and the potential for trade with major markets in neighbouring countries (e.g. China, Russia). Moreover, the highly educated workforce of the GBAO was regarded as a major asset for the future development of the sector. In terms of tourism potential, the assets of the Pamir mountain landscape were regarded as important alongside the multi-ethnic society and its historical heritage.

In the group's opinion, the above assets and opportunities have not yet been exploited due to the region's political history, lack of funds, poor transport infrastructure, and lost ties with former Soviet Union states. Tourism opportunities have reportedly been thwarted by existing visa regulations and the organisational deficits of tour operators.

Research development and knowledge management

The group focused its work on issues related to applied research. Institutional questions in the research and knowledge management sector were not raised. The problems identified in this sector included a lack of, or insufficient research into, alternative energy sources (e.g. geothermal energy), botany (medicinal herbs, crop plants) and biotechnology applications. Besides issues in the field of the natural sciences, the importance of economic research (market and unemployment studies) was stressed.

Research into alternative energy resources, the local genetic pool, and into biotechnology were named as opportunities in this sector. Applications for heating and medical treatments based on geothermal energy resources were named as concrete examples. Research into the genetic pool, or in-depth botanical studies, were regarded as an ideal field for building specialist capacities. Additionally, biotechnology development is expected to produce concrete results and materials. Research into markets and unemployment is regarded as a means of enhancing knowledge of ways to promote more flexible, competitive activities. Besides the funding problems facing this sector, the absence of appropriate equipment and the lack of information and technological capacity were defined as major obstacles.



Visions of the stakeholders

The five stakeholder groups were asked to present an idealistic view of sustainable development for the GBAO by the year 2025. This view was expected to touch upon issues such as how society would be organised, how economic structure and performance would look and how the environment may have developed. Such a vision was not meant to reflect reality, but rather to represent an idealistic view that could serve as a guiding tool for the subsequent elaboration of strategic elements by the concerned thematic sectors.

Local communities

Our vision is that over a period of 20 years, agriculture – including animal farming – will develop and become one of the factors in the improvement of living standards in the GBAO. Government and administration will function in a more democratic way on the basis of the laws of the Republic of Tajikistan.

The role of Village Organisations will be active and there will be self-sufficiency in accordance with the laws of the Republic of Tajikistan. The energy capacity of our rivers will be tapped and will contribute to economic development. High pastures will be used more effectively. The GBAO will depend less and less on the central budget.

GBAO administration

In 2025 the GBAO will be a developed region of Tajikistan, self-sustaining on the basis of internal resources. Government and administration will be functioning according to the international standards that characterise democratic and sovereign governments.

The GBAO population will be 235,000. Civil society will be based on a multiparty system and diversity of opinion, while decisions will be based on polls and referendums. The society will be characterised by a market economy in which the public sector will account for 30%, the private sector 50% and other organisations 20%. It will have ecologically sound ecosystems at all altitudes, to attract tourists.

Restoration of pastures will have taken place by watering and sowing annual and perennial plants. The economic performance of the GBAO will be based on private-sector income and other resources. External investment includes creating joint associations and organisations, cross-border trade, implementation of international projects, and collaboration with countries abroad in all spheres of performance.

Civil Society Organizations (CSOs)

Governmental administrative function will have been delegated to the lowest level possible. Officials are elected by majority vote. Village organisations are given responsibility and authority. The role of the government is to regulate, protect and to provide security. The government will provide the main irrigation channels as well as the transport and telecoms infrastructure; additionally it will provide education and health services. The population in 25 years will be 210,000 among 33,000 households i.e. it will not grow. It is expected that the primary sector will be less dominant with a 33% share of the economy, which is similar to the secondary sector. It is expected that the agrarian sector will produce more cash crops (potato exports, medicinal plant exports, etc.). In the secondary sector, small businesses and infrastructure construction will be balanced. The revenues from tourism will increase through relaxed regulations and improved basic infrastructure.

Ecologically, desertification trends will be reversed in the highlands. Growing importance will be assigned to irrigated pastures and the development of kitchen gardens and horticulture. Alternative energy resources will be used (coal, solar and wind energy). Livestock on the high pasture will total 35,000 sheep and 25,000 yaks. Pressure on wildlife will increase through the use of as yet untouched remote pastures. On the other hand, hunting companies will maintain wildlife habitats. Communities will mitigate hazards through the clearance of mudflow channels.

National administration

By 2025 the population will grow to 260,000 – 265,000. The society will be engaged in energy, industry, agriculture, education, health, tourism, environmental activities, etc. People will work in governmental and non-governmental organisations, the private sector, international CSOs, and joint enterprises. No fewer than five political parties will be active. The economy will develop at the expense of industrial and agricultural production. Tourism, mineral resources (e.g. precious stones) and hydropower production will increase at the expense of trade. Sector distribution will be as follows: 30% energy, 20% industry, 20% tourism, 10% agriculture, 20% services.

Oblast economics will be effectively developed, giving the GBAO the status of a free economic zone. For this it will be necessary to apply and strengthen laws for the region's economic development. Society should be involved in different aspects of production, particularly control of the negative environmental effects of industrial activities.

Private initiatives are leading to an increasing number of small-scale businesses. Meeting the requirements of a market economy and providing favourable conditions are major challenges for the local administration. (Photo: D. Maselli)

Poor transport infrastructure and lost ties with neighbouring countries are regarded as major obstacles to trade and tourism. (Photo: D. Maselli)



By the year 2025 a dynamic balance will be established to provide sustainable development in all sectors of the regional economy, with a ratio of 60/40 for internal and external investment. Comparative analysis shows that in order to achieve the 1991 level of GDP at USD 461 per capita, it is necessary to increase the *oblast* GDP to USD 120 million.

International organisations

In the year 2025 the government and administration will be locally managed according to the slogan "Badakhshan run by Badakhshani". A bottom-up approach has been institutionalised, with community-based organisations active in local and regional governments and a decentralised budget. A democratic society will be established by the year 2025 with locally elected leaders, giving voice to rural and urban interests.

The GBAO will be attractive to foreigners wishing to live in a safe and beautiful environment. Basic education standards will have returned to the USSR level, and incorporate new technologies and critical thinking to help children to adapt to the market system. From the ecological standpoint the GBAO will be sufficiently economically viable to replace fuels such as *teresken*, dung, trees, etc. with alternative renewable energy, especially hydroelectric power. The vegetation cover will have increased considerably, and be able to prevent major soil erosion processes and secure the region's biodiversity.

The primary sector will still be dominant, with a share of 50%. The secondary and tertiary sectors will increase to account for 30% of total domestic production. In general, Tajikistan will not sell raw materials but processed goods. 70% of the workforce will be employed by the private sector; with public sector employees decreasing to 30%. Investments will account for 75% of foreign inputs and aid only 25%.

Appraisal of strategic elements

To determine development priorities, the different sector groups named the three most important strategic objectives and the anticipated outcome. The logical framework was to be completed by indicating important assumptions for each objective's fulfilment. The planning horizon for all strategic sectors was set for the year 2010.

In the subsequent final parallel session, the different stakeholder levels were asked to appraise the sector objectives. A total of 18 objectives (see table p.63) had to be ranked in terms of their importance for the sustainable development of the Tajik Pamirs. Since the implementation of objectives may be regarded as generally important but not as a first priority within the stipulated 8-year timeframe, the stakeholder groups simultaneously defined a second rating in terms of urgency.

Sector assessment

The average appraisal indicates that the greatest importance and urgency is assigned to the strategic elements of the energy and infrastructure sector. The production-oriented sectors (industry, trade & tourism and the agriculture sector) and institutional development were in the middle, while research development and biodiversity objectives came third. This rating clearly reflects the tense economic situation prevailing in the Tajik Pamirs and the most pressing obstacles to be overcome in a short- to medium-term horizon (8 years). Against this background, it is hardly surprising that ecological issues are of less concern and urgency and that potentially long-term research projects whose outcome is uncertain achieved lower ratings.

Stakeholder assessment

A brief analysis of the appraisals by stakeholder groups reveals that the CSOs assigned the greatest importance and urgency on average to the 18 objectives. The ratings by national and local administrations were in the middle, whereas the community and international levels rated the strategic elements significantly lower in terms of importance and urgency. These average ratings may be interpreted in two ways: either the stakeholder groups have different perceptions of the state of the economic and ecological system in the GBAO, or the stakeholder groups do not regard all sector objectives as suitable contributors to sustainable development.

By looking at the detailed results, we can identify three clear leading objectives that influence the economic environment in the Tajik Pamirs. All stakeholder groups rated the development of energy production highest both in terms of importance and urgency. The development of legislation was rated second, followed by the objective of reanimating and establishing enterprises.

Consensus and disparities

An analysis of importance ratings (see figure overleaf) also reveals objectives with a high level of consensus, and objectives with a high level of dissent among the five stakeholder groups. The objectives on energy production (3.2), legislation (4.1), land reclamation (1.2), maintenance of the communications system (3.1) and the re-animation of existing enterprises (5.1) were accorded high to medium importance, with comparatively high consensus among all stakeholder groups. Hence these objectives may be particularly worthy of further examination with a view to potential future implementation.



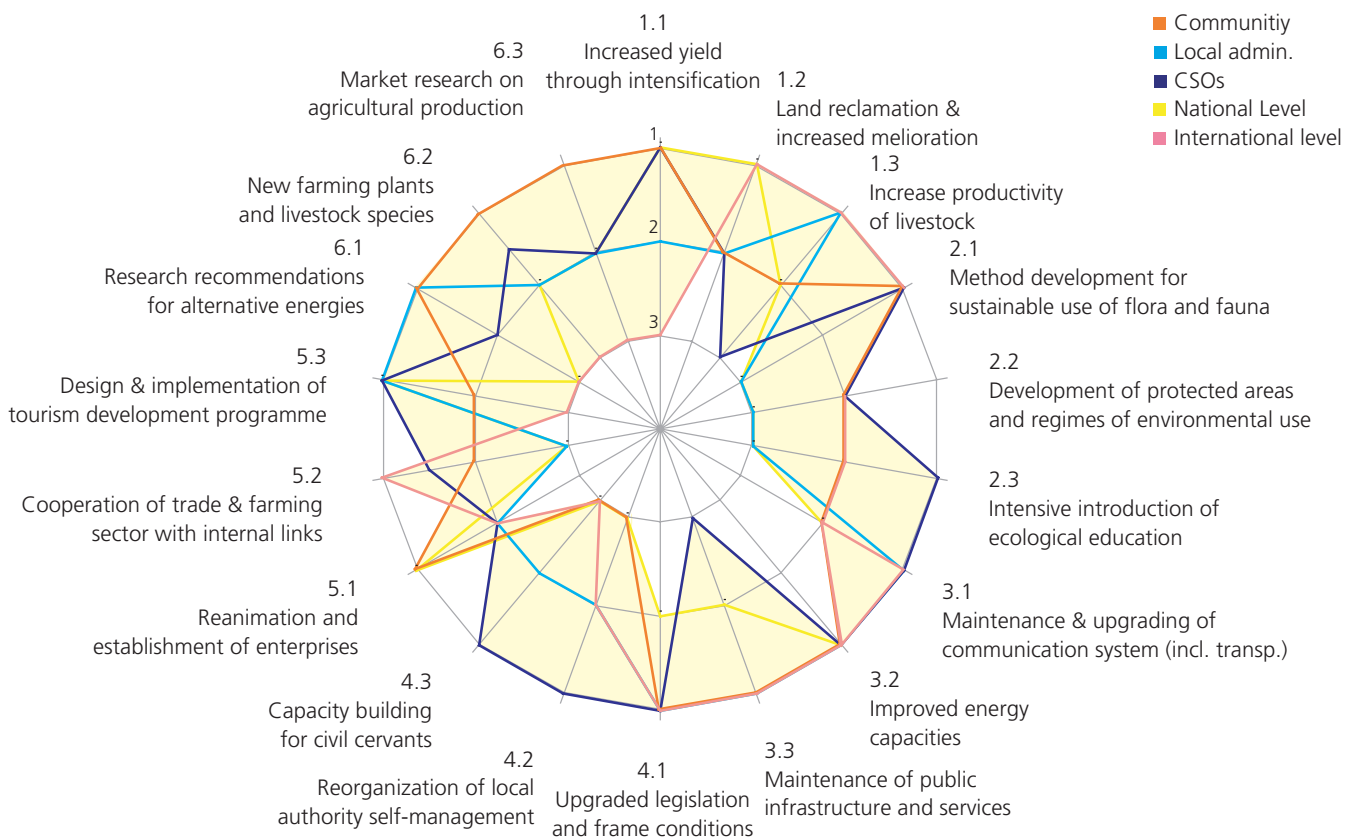
Participants in the Strategy Workshop for Sustainable Development in Khorog, October 2002.
(Photo: D. Maselli)

The above results are supported by an analysis of the urgency appraisal, that ultimately produced three objectives which were accorded high acceptance by all stakeholder groups in terms of importance and urgency:

- Energy and infrastructure: maintain energy facilities/assets, use new power capacities, and increase energy production. Coal production in the GBAO up to 50,000 t per year. (3.2)

- Institutional development: upgrade legislation and create favourable conditions for sustainable development in the GBAO (4.1)
- Industry, trade, tourism: reanimate existing enterprises and create new ones on the basis of the natural resources of the GBAO (5.1)

On the other hand, stakeholder appraisals in terms of importance diverged widely on four objectives that were accorded higher-than-average ratings. The strategic objectives of agricultural intensification (1.1), maintenance of the public infrastructure/services (3.3), elaboration/implementation of a tourism programme (5.3) and research on alternative energies (6.1) probably require additional negotiation among the stakeholder groups.



Appraisal by 5 different stakeholder groups of 3 main objectives in each strategic sector (1 = high importance, 2 = medium importance, 3 = low importance).
(Source: Breu and Hurni 2003b)

Strategy sectors discussed in the workshop

- 1 Agriculture, high pastures and irrigation (1.1–1.3)
- 2 Biodiversity, wildlife and conservation (2.1–2.2)
- 3 Energy and infrastructure (3.1–3.3)
- 4 Institutional development (4.1–4.3)
- 5 Industry, trade and tourism (5.1–5.3)
- 6 Research development and knowledge management (6.1–6.3)



Strategic elements for conservation and environment were not given high priority, reflecting the economic problems of the Tajik Pamirs. (Photo: D. Maselli)

| Strategic objectives | Overall* | Importance | Urgency | Consensus on importance | Consensus on urgency |
|---|----------|------------|---------|-------------------------|----------------------|
| (3.2) <i>Energy and infrastructure</i> : Maintain energy facilities/assets, use new power capacities, and increase energy production. Coal production in the GBAO up to 50,000 t p.a. | 1.0 | 1.0 | 1.0 | high | high |
| (4.1) <i>Institutional development</i> : Upgrade legislation and create favourable conditions for sustainable development in the GBAO | 1.2 | 1.2 | 1.2 | high | high |
| (5.1) <i>Industry, trade, tourism</i> : Reanimate existing enterprises and create new ones on the basis of the GBAO's natural resources | 1.5 | 1.6 | 1.4 | high | high |
| (3.3) <i>Energy and infrastructure</i> : Public infrastructure and health care: Maintenance of existing facilities, provision of new modern equipment, increase in wage levels | 1.7 | 1.6 | 1.8 | low | med. |
| (5.3) <i>Industry, trade, tourism</i> : Design and implement a tourism development programme | 1.7 | 1.6 | 1.8 | low | med. |
| (1.1) <i>Agriculture</i> : Increase level of yield through intensification | 1.8 | 1.6 | 2.0 | low | med. |
| (1.2) <i>Agriculture</i> : Assimilate new land and increased melioration condition of existing lands | 1.8 | 1.6 | 2.0 | high | med. |
| (6.1) <i>Research development</i> : Develop research recommendations for exploiting geothermal and alternative sources of energy for health and industrial applications | 1.8 | 1.6 | 2.0 | low | low |
| (1.3) <i>Agriculture</i> : Increase productivity of livestock by establishing forage bases, improve cattle and develop other spheres (poultry farming, apiculture, etc.) including processing | 1.8 | 1.8 | 1.8 | med. | high |
| (3.1) <i>Energy and infrastructure</i> : Maintenance of existing communication system: TV/radio, transportation. Upgrade systems to the state of the art | 1.8 | 1.8 | 1.8 | high | med. |
| (5.2) <i>Industry, trade, tourism</i> : Develop the trade and farming sector, forge links with neighbouring countries | 1.8 | 2.0 | 1.7 | low | med. |
| (2.1) <i>Biodiversity</i> : Elaborate and introduce rational methods for the sustainable use of biological resources | 2.1 | 2.2 | 2.0 | low | low |
| (2.2) <i>Biodiversity</i> : Conservation, especially of natural territories and regimes of environmental use | 2.1 | 2.4 | 1.8 | high | med. |
| (4.2) <i>Institutional development</i> : Reorganise local self-management structures | 2.2 | 2.2 | 2.2 | med. | high |
| (6.3) <i>Research development</i> : Market research, agricultural and livestock production in the GBAO | 2.3 | 2.0 | 2.6 | med. | low |
| (4.3) <i>Institutional development</i> : Build staff capacities in view of today's requirements | 2.3 | 2.4 | 2.2 | low | med. |
| (6.2) <i>Research development</i> : Create new varieties of farming plants and livestock using the genetic pool of flora and fauna in the GBAO | 2.4 | 2.0 | 2.8 | med. | high |
| (2.3) <i>Biodiversity</i> : Intensive campaign to introduce ecological education | 2.4 | 2.2 | 2.6 | med. | low |

Ranking of strategic objectives by workshop participants.
(Source: Breu and Hurni 2003b)

Note: High importance and urgency = 1, Medium importance and urgency = 2, Low importance and urgency = 3

* The overall rating is the arithmetic average of the values 'importance' and 'urgency'



The purpose of developing strategies is to mobilise internal and external efforts to achieve sustainable development. The Northern Pamir mountains viewed from Sarytash in Kyrgyzstan. (Photo: U. Lutz)

Towards a methodological framework for strategy development

Hans Hurni and Thomas Breu, with one section by Thomas Heimgartner

Apart from outcomes of direct relevance to the Tajik Pamirs, what are the lessons that can be learnt from the Pamir Strategy Project (PSP) for other mountain areas with different political, social and economic contexts? Can the overall methodological framework be applied elsewhere? Are the village studies of the PSP particularly suitable models for drawing up information in a participatory way and thus developing shared knowledge? Do regional statistics and information that have been moulded into a Geographic Information System (GIS) constitute a useful decision-support tool? And finally, are multi-level stakeholder workshops like the one held in Khorog in October 2002 useful for jointly defining a common vision, strategic goals, and elements for sustainable development?

A strategy for sustainable mountain development

According to OECD-DAC guidelines, a strategy for sustainable development should comprise: *“A coordinated set of participatory and continuously improving processes of analysis, debate, capacity-strengthening, planning and investment, which integrates the economic, social and environmental objectives of society, seeking trade-offs where this is not possible.”* (OECD-DAC, 2001: 8). The purpose of strategies is to mobilise efforts to achieve sustainable development. They can do this by providing the means to define visions, choices, goals and principles for sustainable development, and illuminating the historical, ethical and cultural dimensions underlying

these choices and goals (Bass and Dalal-Clayton, 2002). A strategic approach to sustainable development calls for new ways of thinking and working (see box). This includes ongoing improvements in governance, shared responsibility, transparent information, a focus on impacts, integrated planning, and continuous learning.

These basic elements constitute a system that should encourage and facilitate the building of consensus in society with regard to shared visions, goals, and objectives for sustainable development (the central circle), as well as a coordinated set of information and institutional mechanisms to deliver these (the boxes around the circle).

Depending on circumstances, a sustainable development strategy should take the form of a system with the following components (Bass and Dalal-Clayton, 2002):

New ways of thinking and working in a strategic approach to sustainable development

- Move from developing and implementing fixed plans, ideas and solutions, towards operating an adaptive system that can continuously improve governance to promote coherence between responses to different challenges.
- Move from a view that the state alone is responsible for development towards one that sees responsibility resting with society as a whole.
- Move from centralised and controlled decision-making towards sharing results and opportunities, transparent negotiation, cooperation, and concerted action.
- Move from a focus on outputs (e.g. projects and laws) towards a focus on outcomes (e.g. impacts).
- Move from sectoral towards integrated planning.
- Move from a dependence on external assistance towards domestically driven and financed development.
- Move towards a process which can accommodate monitoring, learning and improvement.

Source: OECD-DAC, 2001: 24

Strategies must therefore define goals and identify means of achieving these goals. This implies adopting an approach that is based on good evidence, has an underlying vision, sets priorities, goals and direction, and sets out the main tactics for achieving these (OECD-DAC, 2001: 15–17). Central mechanisms of such a strategy have been compiled in the figure on the right.

- A shared vision, common goals, and a set of strategic objectives.
- Regular communication between stakeholders and opportunities for negotiation at national and sub-national (regional) levels, with links between them.
- Coordinated measures for policy integration, budgeting, monitoring, and accountability.



Agriculture in the Tajik Pamirs will have to be further optimised. Development of the other economic sectors will make it possible to reduce the agrarian workforce and grow cash crops. (Photo: D: Maselli)



Mechanisms contributing to a sustainable development strategy. (Redrawn following Bass and Dalal-Clayton, 2002)

- Principles and standards for adoption by sectors and stakeholders, through legislation, voluntary action, economic instruments, etc.
- Pilot activities to generate learning and promote ownership.
- A facility with authority for coordinating these mechanisms.
- A mandate for all the above from a high-level, central authority such as the prime minister's office and, to the extent possible, from citizens' and business organisations.

A methodological framework for preparing a sustainable development strategy

One of the most important elements for preparing a sustainable development strategy is to enhance knowledge about the social, political, economic and environmental contexts within which the strategy should be applied. Knowledge generation is a process in which those who are expected to gain knowledge should be involved from the outset. In other words, rather than delegating the generation of knowledge to a specialised group of stakeholders, e.g. a team of specialists and researchers, it must be jointly elaborated within the framework of a transdisciplinary process that involves all concerned stakeholders. An example of such a multi-level

stakeholder approach is given in the figure overleaf. In this case sustainable land management has been set as a goal. The figure shows that stakeholders in land management are situated at all levels, from local households to international organisations. Hence representatives of all these institutions should be involved in the process of negotiating and evaluating strategy development.

A knowledge system for sustainable development rests on two major components: concerned actors and stakeholders on the one hand, and related spatial units along with their natural resources on the other hand. Since both components are dynamic, i.e. subject to continuous change, both the status and dynamics of the major elements of both components should be sufficiently known by all concerned, in order to anticipate possible impacts of scenarios or concrete action to be taken in the sustainable development strategy. An instrument entitled 'Sustainable Development Appraisal' (SDA) was developed by Hurni and Ludi (2000) for such participatory assessment of a regional unit and its actors and stakeholders. Basically it consists of a 12-step approach using a transdisciplinary methodology (see table page 67). The SDA is usually applied first to individual villages, and then to groups of villages and entire regions in a process of amalgamation on a different scale.

Experiences in the application of the SDA at the village level in the Pamir Mountains have been gained with the PSP by applying the methodology to three different villages, as described earlier in this publication.

Semi-structured interviews and group discussions are important elements in appraising sustainability at the village level. Such participatory approaches are indispensable for sound strategy development. (Photo: M. Degen).



Village studies as a basis for regional strategy development¹

One of two Swiss-Tajik study teams conducted in-depth studies in the villages of Tavdem and Basid, located in the western part of Gorno Badakhshan. At the same time a similar study was carried out in Kuna Kurgan, a *jamoat* close to Murgab in the eastern part of the GBAO. The aim of these participatory case studies was to gain an insight into daily realities in households and rural communities, as well as obtain knowledge about resource management and conditions at the local level, according to the elements of the SDA. These exemplary field-level assessments provided the backbone for interpreting and classifying the aggregated statistics and information gathered in the more sectoral studies of the Pamir Strategy Project.

Appraising sustainability

The village studies were based on the components and elements contained in the Sustainable Development Appraisal (SDA, Hurni and Ludi 2000), a tool that has been applied and further developed in different geographic and socio-cultural contexts world-wide. Its aim is to combine participatory, transdisciplinary methods with interdisciplinary and disciplinary methods and thus amalgamate quantitative and qualitative data with indigenous knowledge. Particular emphasis is given to the incorporation of both internal views (e.g. local land users) and external perceptions (e.g. researchers), with subsequent attempts to construct a holistic, shared view of a region and its potential for sustainable development.

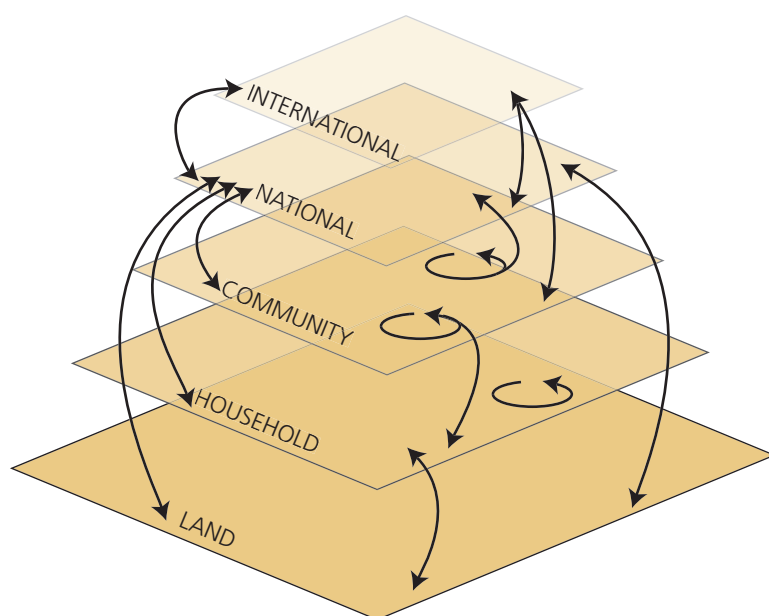
Semi-structured interviews and group discussions provide insight into the functioning of the communities chosen for study. Different actor categories and wealth classes become transparent in this process.

Through mapping and analysis of environmental conditions (e.g. soil, water resources, land use, etc.), the potentials and limitations of the natural system are assessed. On the basis of both these sources of information, core problems, potentials and opportunities for local development are made transparent, and a village development profile is established. The results of the SDA provide an ideal basis for broad discussion of the path of development for the community, and thus for negotiating a development strategy. In future, the SDA will be used as an instrument to monitor the effects of a particular strategy chosen by the communities, since the same approach applied some years after implementation of the strategy will reveal possible impacts in terms of achievements and shortcomings.

Concrete fieldwork at the village level

At the beginning of each of the three village studies, the study team members and the aims of the study were introduced to the population and the local authorities. An overnight stay in the villages helped to create an atmosphere of mutual respect and acceptance. Both steps were indispensable prerequisites for participatory research, e.g. in subsequent group discussions. The second day was used to carry out a wealth ranking³ and a transect walk through the village area. The aim of the transect walk, guided by a villager, was to gain insight into local history and an overview of natural resources and the territorial order of the community. This preliminary analysis was used to determine different social classes and biophysical units in the villages.

On completion of this preparatory phase, the four subject specialists in the study team pursued their individual studies for one week. On the basis of the wealth ranking, the social economist selected six households for semi-structured interviews. These were based on an open question-



Sound management of natural resources will guarantee the survival of threatened species and at the same offer local people a source of income. (Photo: P. Sieber)



naire, with issues ranging from education and health care to irrigation and traditional farming. The interviews focused particularly on change and how it affected the household. The answers shed light on individual perceptions and people's fears and hopes. The household interviews were complemented by a focal group discussion on the socio-economic situation of the community and on the role of women in society.

At the same time a resource management specialist focused his studies and interviews on farming practices, soil degradation problems and deforestation, animal husbandry, horticulture, and water management and irrigation issues. In addition, village agricultural calendars completed the picture of the local farming sector as the dominant economic sector. In order to assess current land use and estimate potential alternatives, an agronomist and a mapping specialist drew up a plan of the village area. Each spatial unit was mapped in terms of soil quality, current and potential land use, connection to the irrigation system, and potential risk of soil degradation. Elements of public infrastructure such as roads, schools, and micro hydropower stations were also mapped.

On the last day local stakeholders, interview partners and the study team gathered to present the preliminary findings of the various SDA studies. The meeting concluded with a discussion focusing on opportunities and obstacles to be overcome in promoting the sustainable development of the villages concerned.

Data evaluation and follow-up

Ten days of intensive research by four persons produced a considerable amount of data. This wealth of information was used to prepare a Local Development Profile (LDP), including a Geographical Information System (GIS). The LDP is a portrait of a village containing general data such as statistics on population, topography and distance, more detailed information on agriculture, water and energy resources, and information on public infrastructure and services. GIS plays an important role: besides providing baseline information on the state of the actual land use system, it also can help identify potential areas for intensified land use or land reclamation.

The LDP concluded with a list of development needs, options and constraints

from an external point of view. This was ultimately contrasted with the view of the local population (see preceding chapter on the Khorog Strategy Workshop), revealing areas of consensus as well as issues with divergent ratings that probably require further negotiation.

Lessons learned

Overall, experience with the SDA in terms of project implementation was positive. From a methodological point of view, the SDA proved once more to be a practical tool, facilitating close and fruitful cooperation between external specialists and people living in the villages. On a topical level, the village studies played a major role in the overall objective of the Pamir Strategy Project. In particular, they contributed a great deal towards a better understanding of living conditions, and significantly enhanced knowledge of the Tajik Pamirs. One major advantage was that the village studies made traditional sources of information (e.g. statistics and subject reports) more concrete, thus better reflecting local realities and ultimately contributing a great deal to the subsequent process of strategy development in the Tajik Pamirs.

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

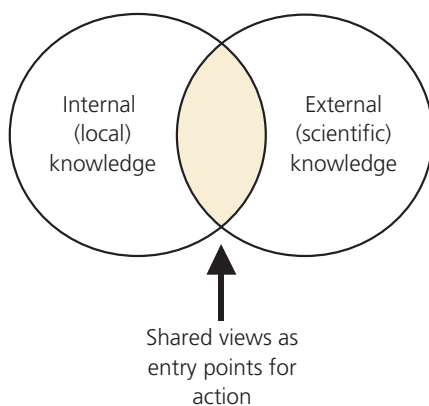
Satellite imagery and Geographic Information Systems reveal natural potentials, facilitate planning, and are ideal tools for monitoring. As such they constitute highly valuable instruments in the process of strategy development and implementation. (Map by C. Hergarten)



Geographic Information Systems (GIS) as a decision-support tool

Progress in the development of Geographic Information Systems (GIS) and Remote Sensing (RS) techniques, coupled with the promotion of user-friendly and cost-efficient systems, has led to a major increase in the user community, including users in transition and developing countries.

Mountain regions in particular often lack a reliable and accurate spatial information base, thereby impeding decision-making processes and the implementation of strategies and development programmes. The high variability and small spatial scale of mountain areas such as the Tajik Pamirs makes setting up a GIS in such areas a challenge. The high spatial variation in altitude results in small-scale patterns of climate, soil, and land cover. Limited accessibility in mountain areas may lead to the development of totally different cultural, land use and livelihood systems within a relatively small area. As a result, most development-relevant aspects and corresponding vari-



The transdisciplinary approach of the Sustainable Development Appraisal (SDA). (Hurni and Ludi, 2000)

| | | | | |
|---------|---|---|---|--|
| Day 1 | Introduction at the local administration in Basid and Tavdem Preparation of wealth ranking and transect walk | | | |
| Day 2 | Wealth ranking and analysis (division of village into 3 social layers) Transect walk | | | |
| Day 3–9 | Expert 1 Socio-economics <ul style="list-style-type: none"> • 6 semi-structured interviews (2 in each wealth class) • Group interviews | Expert 2 Resource management <ul style="list-style-type: none"> • Group interviews with farmers • Elaboration of agricultural calendar | Expert 3 Agronomy <ul style="list-style-type: none"> • Assessment of current land use and soil quality • Estimation of alternatives in use | Expert 4 Mapping <ul style="list-style-type: none"> • Main spatial units • Infrastructure mapping • Land use mapping |
| | Exchange and discussion of information gathered during the day Interviews with key persons (forester, trader, nurse, etc.) | | | |
| Day 10 | Group discussion of opportunities for and obstacles to sustainable village development | | | |

Overview of the SDA carried out in Basid and Tavdem

ables are characterised by great spatial heterogeneity and major efforts to collect and analyse data.

Given the ambitious and comprehensive objective, the PSP aimed to compile, as far as possible, geo-referenced data on natural resources, topographic features and socio-economics. For this purpose data was derived from existing maps on different scales. In addition, remotely sensed data on the project area was acquired and processed, tabular data was collected in cooperation with the PSP partners, and data from the field studies was integrated into the Information System. A number of models were also prepared (e.g. population density and climate models) and, along with appropriate training, handed over to the partner institutions of the Pamir Strategy Project. It is hoped that the versatile and detailed PSP Information System will be widely used in different contexts and will serve as a reference for planning and monitoring in the Tajik Pamirs.

Project identification and planning

The major objective of the PSP Information System is to contribute to the elaboration of a cohesive planning system for sustainable resource management at the regional level, by providing a basis for geographic priority-setting for project implementation. The database and related statistics along with the maps therefore offer highly practical tools for project activities at reconnaissance level, since they substantially speed up the planning process and significantly increase the likelihood that planning will be sound. With regard to the numerous activities at the village level in the GBAO, the PSP GIS has the potential to serve as a basis for project steering, management and monitoring.

Scenarios for decision-making

The PSP Information System can contribute to the construction of more complex and more accurate models and scenarios for development, thereby contributing to more informed decision-making. The following section outlines a few of the numerous potential applications for this versatile spatial information system:

Disciplinary research on status and dynamics is a requirement for strategy development. However, an appropriate knowledge base can be achieved only through participatory valuation and enhancement based on interdisciplinary and transdisciplinary processes.
(Photo: A. Haslinger)



- Probably the most interesting PSP application for the Tajik Pamirs would be the localisation and assessment of natural resources which have not been tapped or fully exploited to date. To support conservation of the natural production base, PSP data on demography, land use, livestock, soil and climate data can be used to obtain a model of the impact of human activities on natural resources. Such models can support sustainable land management and facilitate the implementation of corrective measures.
- As another example the digital terrain model (DTM), could be used in communications and transport infrastructure planning in conjunction with geological, hydrological, demographic and economic data, to facilitate the assessment of options with the maximum benefits, lowest costs, and the lowest negative impact on natural resources. In conjunction with micro-climatic data, the DTM would constitute the basis of prediction models for runoff and glaciological events.

Awareness creation, training and policy advice

On the one hand, PSP data constitute a technical tool whose primary use is technical planning and monitoring in the fields of natural and human resource management. On the other hand, the statistics, models and simulations produced on the basis of the PSP data have other concrete and practical uses: they can be used to create awareness among the population or specific target groups with regard to sustainable management and the use of natural resources. In this way the PSP info system can help to promote the idea of sustainable natural resource conservation on a larger scale. Furthermore, it can be used by universities, research institutes, etc., for training in the field of watershed management in particular, and sustainable natural

resource management in general. Finally, the PSP database and related case studies constitute an integrative tool that can contribute to informed decision-making and the formulation of adequate policies in various fields.

Multi-level stakeholder workshops for initiating strategy development processes

Organising multi-level workshops for initiating the process of strategy development is a practical way of providing equal opportunities to concerned stakeholders for sharing current information and jointly developing strategic sectors.

The process of strategy development can be broken down into five major steps during the multi-level stakeholder workshop (see figure on page 57):

- In a first step, information collected from village studies, statistics, maps and literature on the concerned region is presented to the participants. Information that has been accorded different values by different stakeholders is presented as far as possible according to these views, e.g. as 'internal' or as 'external' view.
- In a second step, a list of strategic sectors is jointly established by all participants. Participants are then divided into groups so as to ensure that, for each strategic sector, at least one representative of a stakeholder category is assigned to each group. Group work is divided into two parts in order to define problems and needs as well as assets and opportunities for each strategic sector. The results of each group work package are then presented and further synthesised in plenary.
- In a third step, work groups are reorganised such that each working group consists of one stakeholder level. These

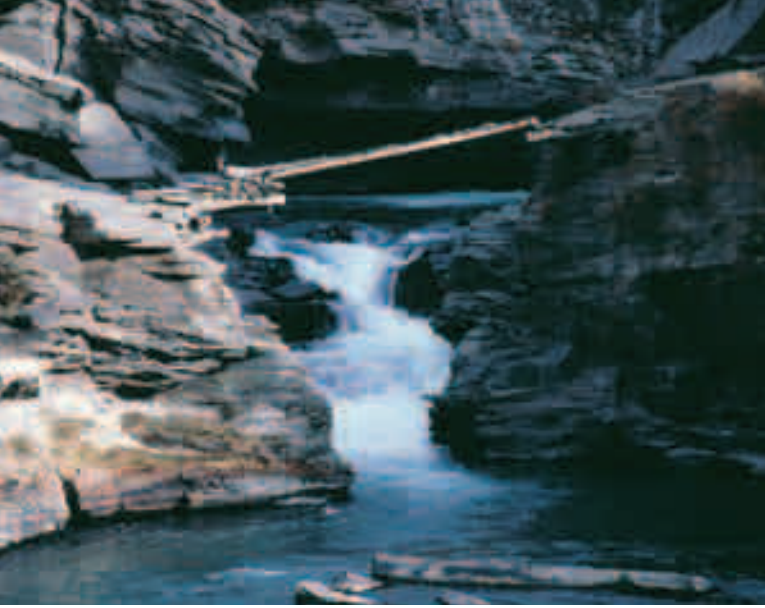
groups now define specific visions of sustainable development from the perspective of their stakeholder level. A plenary is then held with the aim of developing a joint vision.

- In a fourth step, strategic elements are elaborated again by sector, while the original groups are reformed, i.e. each group consisting of mixed stakeholders. These elements are presented in plenary.
- In a fifth and last step, each stakeholder category appraises the different elements of the strategy by sector according to importance and urgency, and again discusses the results in plenary. The final concrete outcome of the workshop is a common draft strategic vision.

This type of strategy workshop extends over a period of four full days, resulting in a wealth of information and significant progress towards shared knowledge and common visions and goals. Feedback on the Khorog workshop was very positive, particularly because of the clear structure and step-wise approach, as well as the structured interaction among different stakeholders in changing groups. The overall workload required from each participant, as well as the tight schedule and short time allocated for each step (usually half a day) were less positively evaluated. Finally, the methodology and approach were highly rated.

1 This section was prepared by Thomas Heimgartner.

2 Wealth Ranking is a participatory method to assess social stratification. Selected village representatives were asked to assign all households to three wealth classes (well-off, constrained, struggling).



Energy generation must be maintained and enhanced in line with the needs of the local production sector and export requirements. (Photo: D. Maselli)

Governance must continue to be improved to benefit all segments of the population; thereby ensuring shared responsibility, accountability and transparency in planning and decision-making. (Photo: U. Lutz)



Recommendations for a sustainable development strategy in Gorno Badakhshan Autonomous Oblast (GBAO)

Hans Hurni and Thomas Breu

The process of developing a strategy of sustainable development in the Pamir Mountains of Tajikistan was started by the Pamir Strategy Project (PSP) in mid-2001. The task of continuing this process now lies with the sovereign population of the Gorno Badakhshan Autonomous Oblast (GBAO), its government and administration, while only marginal support can be expected from outside the region. Alongside a number of concrete visions and goals already set and prioritised during the Strategy Workshop for Sustainable Development, it is important that the GBAO Government now establish a facility with authority for coordinating the mechanisms of a sustainable development strategy. Such a mandate should be granted by the administration jointly with local NGOs and business representatives. International technical cooperation could be called on, if needed, in order to support both this process and the associated elements for its concrete implementation.

A common vision for sustainable development

At the Khorog workshop in October 2002, five different stakeholder categories were invited to develop a vision of GBAO by the year 2025: local communities, GBAO administration, NGOs, national representa-

tives, and international organisations (see chapter on the workshop). In the following text the authors of this publication have amalgamated the five different visions into a single vision (see box to the right).

Prioritised goals for sustainable development

Based on the shared visions, problems and opportunities defined at the Khorog workshop, the goals and main objectives for each of the strategic sectors were defined as follows.

Agriculture, high pastures and irrigation

Since spatial expansion of irrigated agricultural systems is virtually impossible now, higher productivity will have to be achieved through increased efficiency of labour inputs. A reduction in the workforce will be inevitable, and hopefully offset by development in other sectors of the economy. As the economy grows, it will be possible to grow more cash crops for sale on local markets. Food self-sufficiency will be maintained at 70% for a stable population in the GBAO, while horticulture crop farming will be increased. High pastures will be more intensively used even in more remote areas, while efforts to export produce will be stepped up to enhance economic viability. Winter fodder production will be enabled through hay production on irrigated meadows.

Common vision of a sustainable GBAO

In the year 2025, the GBAO will be a developed region of Tajikistan, self-sustaining on the basis of mostly internal resources. Government and administration will be functioning according to international standards, applying principles of human rights, democracy, subsidiarity, and global ethics. Civil society will be based on a multi-party system and diversity of opinion; decisions will be based on polls and referendums. The population will be stable at approximately the current level (220,000).

The economy will be market-based with the three sectors accounting for roughly one third each. Thus the agricultural sector will produce two-thirds cash crops per farm, with growing importance accorded to irrigation (horticulture, crops and pastures) as well as livestock in the high pastures. The secondary sector will be dominated by small enterprises and infrastructure building activities such as mineral exploitation and hydroelectricity generation. Tertiary sector activities will consist of health care, education and administration as well as tourism, which will benefit from relaxed regulations and an improved infrastructure.

Ecologically natural resources will be protected against degradation by multiple measures aimed at the sustainable use and conservation of wildlife resources, effective management of water resources, soil and water conservation within the context of irrigation management, and the sustainable use of vegetation, in particular of woody biomass. In external relations, the GBAO will benefit from a free-trade zone policy, and foreign financial flows will consist of 75% investment and only 25% humanitarian aid.

Source: Based on Khorog Workshop, 2002



Research and knowledge management should also focus on combining traditional with modern knowledge to contribute to improved living conditions.
(Photo: K. Heilig, AKDN)

Incorporation of new processing units and generation of new products using local resources, for better domestic, regional and international market integration. Kulma Pass road linking the Tajik Pamirs with China and Pakistan through the Karakorum Highway.
(Photo: D: Zibung)



Biodiversity, wildlife and conservation

The Pamir Mountains will be managed in zones specifically designated either as fully protected nature reserves, located mainly within the Tajik National Park, or as zones for restricted, buffer and development applications as well as for controlled hunting. Good management of these zones will guarantee the survival of threatened plant and animal species. Illegal poaching will be prohibited while at the same time the sustainable use of wildlife will be organised so as to provide local stakeholders with a major share of the profits. Woody biomass use will be permitted only for cultivated trees, while the substitution of woody biomass energy by other renewable (or possibly fossil-based) energies will be promoted.

Energy and infrastructure

The existing power-generating infrastructure is to be maintained and enhanced in line with the need for electricity for industrial production and export. This infrastructure should also be operated at efficient levels of use, with new technologies incorporated in the communications and public infrastructure.

Institutional development

Priority will be given to eradicating contradictory policies and building a cohesive legal system that will facilitate realisation of the sustainable development vision in the GBAO. This includes ongoing improvements in governance, shared responsibility, transparent information, a focus on impacts, integrated planning, and continuous learning. A special authority for this process will be assigned by the government, with its activities controlled within a public-private partnership framework. The option of a free-trade zone will constitute an element of study.

Industry, trade and tourism

The objective will be to build on the existing infrastructure and provide a sound policy basis for incorporating new production units, with the aim of generating products for local, national and international markets using local resources, both human and natural. Trade will be enhanced particularly at the cross-border level, provided international market restrictions can be resolved. Another major objective is to design and implement favourable conditions for tourism development.

Research development and knowledge management

Research must contribute to the improvement of living conditions in GBAO and support sustainable development in all dimensions. The status and dynamics of natural resources, their spatial distribution, and their use by various actors must be continuously monitored, and processes must be assessed through scientific research and studies. The focus should be on interdisciplinary and transdisciplinary studies that enable a comprehensive, integrated view and facilitate innovation in the interests of sustainable development. Research and higher education must be developed in a decentralised form that provides access to education even for students in remote locations.

Establishment of a sustainable development authority in the GBAO

The next immediate step for the government of the GBAO is to establish a high-ranking authority responsible for coordinating, supervising, monitoring and evaluating the implementation of the sustainable development strategy as a whole, as well as the sectoral goals defined above. Implementation will be handled by involved administrative, business and non-governmental organisations, as well as community committees elected by their communities. Such an authority must be governed within a public-private partnership framework that ensures broad-based representation of the sovereign people of Gorno Badakhshan.

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List of abbreviations

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| ACTED | Agency for Technical Cooperation and Development |
| AKDN | Aga Khan Development Network |
| AKF | Aga Khan Foundation |
| ASSR | Autonomous Soviet Socialist Republic |
| CDE | Centre for Development and Environment |
| CIS | Commonwealth of Independent States |
| CSO | Civil society organisation |
| DAC | Development Assistance Committee |
| DTM | Digital Terrain Model |
| GBAO | Gorno Badakhshan Autonomous Oblast |
| GDP | Gross Domestic Product |
| GEF | Global Environment Facility |
| GIS | Geographical Information System |
| GMPP | Global Mountain Partnership Programme |
| GTZ | German Agency for Technical Cooperation |
| IUCN | The World Conservation Union |
| KGB | The Committee for State Security |
| LDP | Local Development Profile |
| MAB | Man and Biosphere |
| MSDSP | Mountain Societies Development Support Programme |
| NABU | Naturschutzbund Deutschland |
| NCCR | North–South, National Centre of Competence in Research North–South |
| NGO | Non-governmental organisation |
| OECD | Organisation for Economic Cooperation and Development |
| PSF | Pharmacists Without Borders |
| PSP | Pamir Strategy Project |
| RS | Remote sensing |
| SDA | Sustainable Development Appraisal |
| SDC | Swiss Agency for Development and Cooperation |
| SLM | Sustainable land management |
| UCA | University of Central Asia |

UNCCD United Nations Convention to
Combat Desertification
UNESCO United Nations Educational, Scien-
tific and Cultural Organisation
UNU The United Nations University
USSR Union of Soviet Socialist Republics
VO Village organisation
WCED World Commission on Environment
and Development
WWF World Wide Fund for Nature

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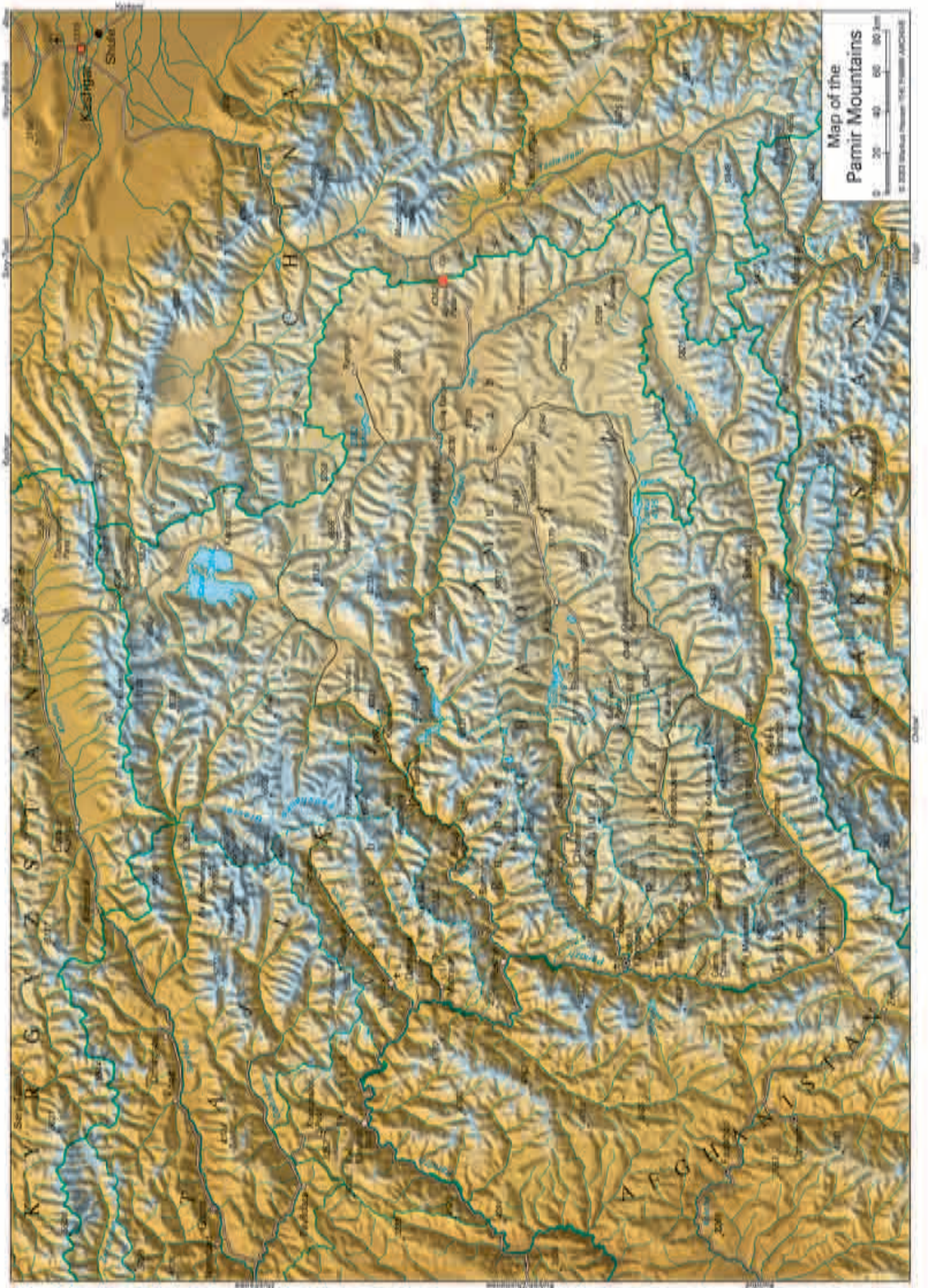
Held in Khorog, Tajikistan, 21–24 October 2002

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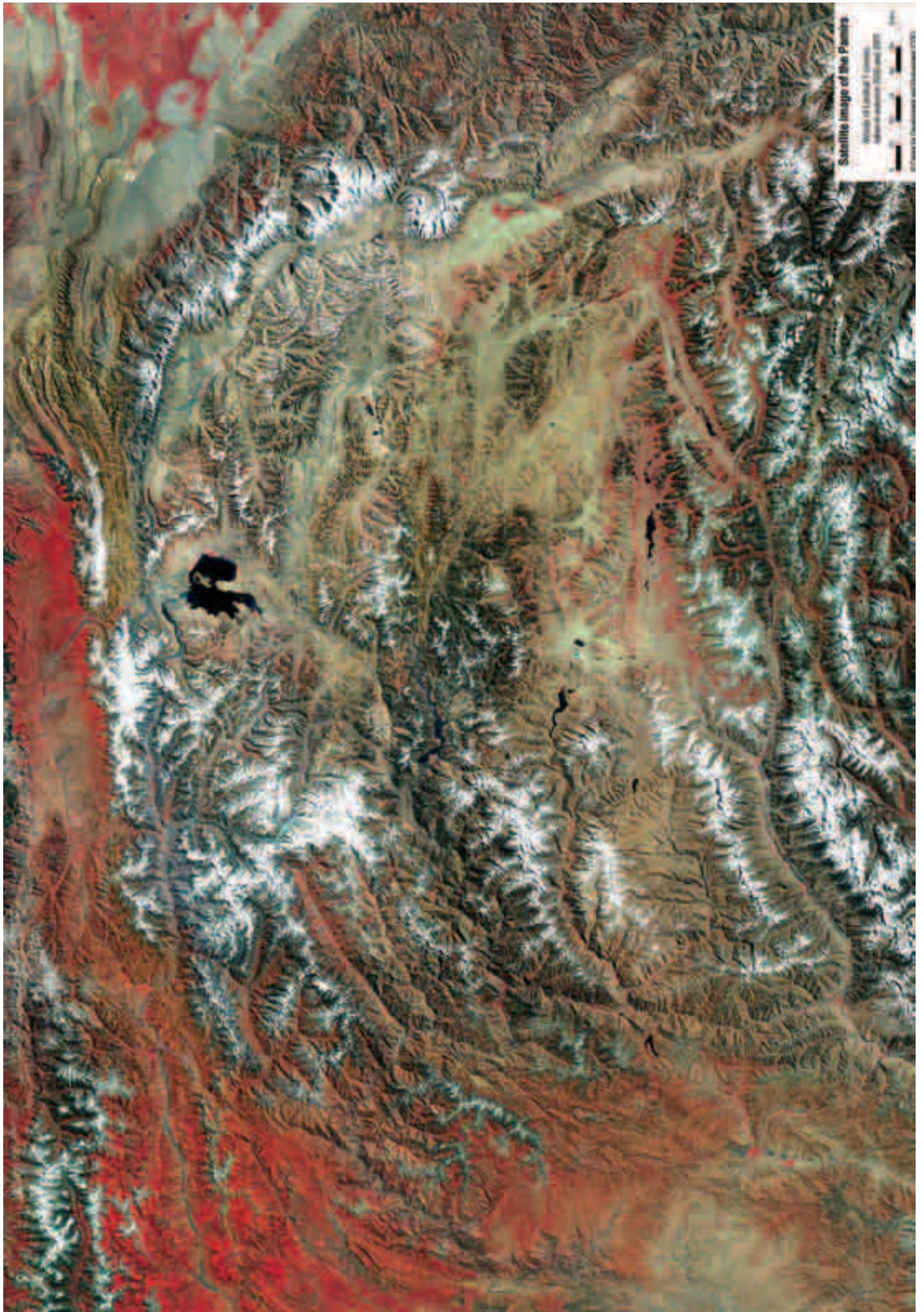
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A GIS-based map of the Pamir Mountains



False-color satellite image of the Pamir Mountains

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Cover photos:

Cover: The Pamirs: view from Darvaz on the way from Dushanbe to Khorog. (Photo: D. Maselli)

Part I:

View of the middle part of Fedchenko Glacier with Somoni Peak (7495 m asl) in the background to the right. (Photo: W. Schatz)

Part II:

Shepherd with fuelwood on his way home in the Shakh dara valley. (Photo: D. Maselli)

Part III:

Suspension bridge over the Shakh dara river near the village of Roshtkala. (Photo: D. Maselli)

Promoting sustainable development in the high mountain region of the Tajik Pamirs is a great challenge in political, economic, social, and ecological terms. The Pamirs, along with other mountain regions in the former Soviet Union, have been particularly affected by economic and political transition after 1991.

Using an innovative approach, the Pamir Strategy Project (PSP) supported stakeholders in their search of solutions and in developing strategies to address the manifold problems they face in their mountain region. The project also contributed to the development of methodological approaches for other mountain regions.

The present publication provides a summary of the outcomes of the PSP. It portrays life in the Pamirs, along with development challenges and options, and presents practical and participatory approaches that can lead to sustainable mountain development. In addition, this publication outlines the lessons learnt within the PSP by presenting and evaluating methods and approaches such as participatory villages studies, multi-level stakeholder workshops for strategy development, knowledge generation processes, and Geographic Information Systems as decision support tools for sustainable mountain development.



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