



Addressing Environmental Risks in Central Asia Risks · Policies · Capacities

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Environmental Governance Series



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While the linkages between environment and security are broadly acknowledged and recognized, much work remains to be done on understanding the nature of the causes and direction of the effects. Without such an understanding, policy responses will not have a lasting impact on the trends and dynamics of a given sub-region. What is notable in cases of environmental insecurity is that the conflicts or conflict potential is generally not the result of an innate scarcity of resources, but a failure in the ability or willingness of states to find workable solutions to the problems. While numerous inter-state agreements exist on resource management and governance, there is a lack of implementation often due to inadequate resource management, exacerbated by a lack of necessary wherewithal to implement the necessary reforms.

Within the Central Asian context, this study aims to address this problem both at the national and sub-regional levels.

At the national level, it will provide information on the legal, institutional and political frameworks in each of the Central Asian Republics in order to facilitate and improve government functioning on a national basis. By determining which difficulties are the result of institutional failure, solutions may be found to amend or adapt existing frameworks, or, where necessary, identify where new mechanisms should be created.

Also, by ensuring that full information is available on the various national frameworks, the study allows for a sub-regional comparison to be made. Such a comparison may help policy makers and international organizations alike to identify the lacunae and misalignments in policy, as well as identifying areas – both geographic and thematic – where sub-regional cooperation is working or possible.

It is intended that this information will provide the basis for sustained and dynamic policy dialogue at the sub-regional level on ways to improve sub-regional cooperation in the areas of environment and security. This study is a part of the joint initiative by the Organization for Security and Cooperation in Europe (OSCE), the United Nations Environment Programme (UNEP) and the United Nations Development Programme (UNDP) to promote the use of environmental management as a strategy for reducing insecurity in the sub-regions of South Eastern Europe and Central Asia.

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This scoping report explores the potential threats to human development and security emanating from environmental risks in five Central Asian states (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan). Adelphi Research prepared the report on behalf of the UNDP Regional Office for Europe and the CIS in Bratislava, for presentation at the Kiev Ministerial Conference in May 2003. It is a component of the Environment and Security Initiative, a joint UNDP, UNEP and OSCE project. It is based on publicly available data and consultation with UNDP and OSCE representatives in the countries.

This report assesses major environmental risks relating to security, and describes the socio-economic context and institutional and policy framework available to address such risks in the five Central Asian countries. Building upon this analysis, the following conclusions are drawn:

- Environmental degradation and resource scarcity have not been a direct cause of violent conflict in any of the Central Asian republics, but have contributed to accelerating existing political and social crises and heightening ethnic tensions.
- Key environmental issues threatening human development and security in the region include growing demand for water, high levels of water pollution, soil erosion and degradation and air pollution. Differences among countries are considerable but smaller than the differentials between central and peripheral areas within countries.
- Traditional resource conflicts over shared water resources seem less likely than often assumed. However, the impacts of water pollution upon human development and transboundary security have been underestimated.
- The socio-economic burdens of environmental degradation disproportionately affect weaker social groups. Environmentally triggered or heightened tensions

arise at the sub-state level and in already marginalized and remote areas.

- Institutional structures are limited, especially at sub-state level, and suffer from weak implementation, limited technical capabilities and a lack of finance and human resources.
- The existing legislative and institutional basis is characterized by sectoral approaches. There is a need to improve coordinating institutional structures and participatory mechanisms.

The analysis presented in this scoping report yields the following recommendations:

- Strengthen institutional capacities in three key areas: (a) institutional and administrative development, (b) sustainable resource management, conflict prevention and mediation, and (c) regional framework programmes.
- Improve environmental policies and foster transboundary cooperation in vulnerable regions.
- Conduct integrated assessments.
- Enhance the knowledge base relating to local contexts.
- Develop early warning indicators and monitoring systems.

In-depth assessments and consultations with national and local stakeholder groups are essential to gain a common understanding of these risks and create ownership of responsive policies.

1 Introduction

Central Asia, encompassing the southern provinces of the former Soviet Union, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, is rich in natural resources, most still untapped. In Kyrgyzstan and Tajikistan, large quantities of water are stored in the mountain glaciers. Kazakhstan, Turkmenistan and Uzbekistan have huge and mostly unexplored oil and gas deposits.

At the same time, almost half of the populations of these countries live in poverty and lack sufficient natural resources to sustain their livelihoods, while the countries' wealth is unevenly distributed. The region suffers from significant ecological disasters and the legacy of the past. Central Asia was the nuclear testing ground for the Soviet Union since the late 1940s. This has impacted upon human health and fragile ecosystems. To supply cotton crops to the Soviet Union, large-scale irrigation systems were built, contributing to the degradation of the Aral Sea and Caspian Sea. The consequences of colonial authoritarianism, forced secularization, central economic planning and the establishment of artificial borders in the region include severe ecological degradation, forced migration of ethnic groups, and interethnic competition for land, water and other increasingly scarce resources. Environmental risks and social and economic development are intertwined, leading to the emergence of environmentally triggered or accelerated crises and tensions at the sub-state level.

While there are common characteristics among these countries, their political and social geography is highly diverse. In this report we take a closer look at the differences between these countries and explore the potential threats to human development and security emanating from environmental risks.

Rationale of the study

Adelphi Research has been asked by the UNDP Regional Office for Europe and the CIS to prepare a scoping report on environmental

risks in Central Asia and their potential security implications. This report was prepared between 15 March and 15 April 2003. As most of the existing reports on environmental stress focus either on ecological disasters around the Aral Sea and Caspian Sea or the regional dimension of environmental decline and political and social instability in Central Asia, the present report examines the national level in order to gain insights into the very specific differences among the environmental risks prevailing in these countries. The report analyses the main environmental risks, the socio-economic conditions and policies, and the institutions to address these challenges.

Environment and security linkages

Environmental degradation and scarcity or the uneven distribution of natural resources have emerged as an important trigger or accelerating factor of tensions within and among nations, although they occur mainly at the sub-state level. Environmental decline and resource scarcity lead by no means directly to violent conflict. They are rather one strand within a complex web of causality in which a series of socio-economic problems – such as population pressure, poverty, forced migration, refugee movements, political instability and ethno-political tensions – are intertwined. Environmental degradation and natural resource scarcity are both causes and outcomes of these socio-economic problems or are intensified by them. The increasing scarcity of fresh-water resources, the loss of ground cover vegetation, desertification, global climate change and rising sea levels are primarily the outcome of human-induced transformation processes. These negative environmental changes are the result of resource-intensive, partially resource-wasting patterns of production and consumption, and of inadequate agricultural practices which, in combination with the above-mentioned socio-economic problems, can expose national and international security to substantial risks.

The region suffers from significant ecological disasters and the legacy of the past

Environmental degradation and natural resource scarcity are both causes and outcomes of socio-economic problems

"Environmental stress is seldom the only cause of major conflicts within or among nations. [...] Environmental stress can thus be an important part of the web of causality associated with any conflict and can in some cases be catalytic." (WCED 1987:291)

Since environmental degradation often triggers or accelerates already existing development dilemmas, it also affects basic human needs and sustainable livelihoods, and can become a substantial threat to human security. In this report we look at environmental risks that threaten human security and the linkages among environmental degradation, unfavourable socio-economic conditions and tensions.

The Environment and Security Initiative

This scoping report is integrated within the Environment and Security Initiative, a long-term process to assess environmental risks, develop an assessment methodology and conduct regular consultations with local stakeholder groups. The initiative is a joint effort of the United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP) and the Organization for Security and Cooperation in Europe (OSCE) with pilot projects in Central Asia and South Eastern Europe. It seeks to facilitate a collaborative process with key public officials, NGOs and development agencies on security-related environmental risks, sustainable resource use and environmental cooperation in order to foster peace and stability. It envisages developing a series of programmes and projects under the three key areas of the initiative: Vulnerability Assessment & Mapping, Policy Development & Implementation, and Capacity Building & Institutional Development. Further information on the Environment and Security Initiative is available from the website at www.envsec.org.

Aim and scope of the report

This report will provide a better picture of the strengths and weaknesses of national policies and institutions to address environmental risks by comparing the Central Asian countries. It will also help to identify where national and multilateral donors can assist. Our analysis focuses on environmental risks and their potential threats to human development and security. Elements of the concept of human security comprise food and water, individual, community, environmental, health and economic security. But we also consider the occurrence of political tensions between states and social tensions at the domestic level. The study provides a brief outline of the most relevant environmental risks that affect security concerns for each of the countries and an overview of key institutions dealing with the socio-economic impacts of environmental risks. We examine the level of integration of environmental concerns into other sectoral policies and evaluate to what extent each country has already developed and implemented policies and measures to adequately address these challenges.

The study provides a brief overview of the basic structures of national environmental policies and identifies deficits in the legal system and with regard to implementation. It reviews the extent to which policies address environmental, social and economic issues in an integrated fashion.

This report will be presented to the public on the occasion of the fifth Ministerial Conference "Environment for Europe" in Kiev in May 2003, along side a further report of the Environment and Security Initiative and an outline of the further development of the Initiative. Policy makers in national governments and regional and international institutions as well as representatives of civil society may benefit from this scoping report. It is intended to help them and UNDP to identify areas of concern which need to be addressed through the means of the respective institu-

Environmental stress can be an important part of the web of causality associated with any conflict

The concept of human security comprises food and water, individual, community, environmental, health and economic security

tions. Special emphasis will need to be given to addressing the environmental factors that accelerate or trigger conflicts, and to improving the socio-economic conditions for the promotion of sustainable human development and peace. Although this report has an extensive scope, it can only be a preliminary step towards more comprehensive integrated assessments, conducted jointly with local partners in the region and agreed upon in a sequence of consultation meetings.

Methodology

This report builds on publicly available data and draws mainly on sources from UNDP, UNICEF, the World Bank and the Asian Development Bank, as well as domestic documents and reports such as National Environmental Action Plans, National Environmental Policy Plans and other official documents on public health, education and social policy.

Since official data – both on environmental quality as well as key economic and social indicators – vary considerably or are scarcely available for all countries under consideration, UNDP country offices in Tajikistan, Turkmenistan and Uzbekistan and OSCE field presences in Kyrgyzstan, Tajikistan and Turkmenistan cooperated in this joint effort. They contributed to the preparation of this scoping report by providing data, relevant documents and comments on an earlier version of the report. A questionnaire was prepared and sent to the respective country offices and missions asking for key environmental risks and their security relevance, existing institutional structures as well as policies and measures in place to address these challenges. This survey provided an important basis, allowing us to assess the complex links between environmental degradation and their implications in security terms.

Structure of the report

Chapters two to six comprise country case studies, which follow the same structure. In each, section one provides an overview of major environmental risks posing direct or indirect threats to national or human security. Section two elaborates on socio-economic conditions and capacities as key parameters for an assessment of the vulnerability of communities to environmental risks. Section three presents a brief overview of policies and institutions to address the risks identified. Participatory elements in decision-making as well as transparency and accountability of government policies and measures are considered a crucial element in effectively addressing these links. We focus especially on policies and programmes which address environmental risks and security threats in an integrated fashion.

Against the background of this cross-country analysis, chapter seven draws conclusions on key constraints for environmental governance in Central Asia. Chapter eight makes preliminary recommendations on ways to address these shortcomings. Several boxes throughout the report illustrate environment and security linkages, highlighting regional specifics, hot spots or success stories.

UNDP country offices and OSCE field presences cooperated in this joint effort

Boxes throughout the report illustrate environment and security linkages

2 Kazakhstan

Kazakhstan is located in the north of Central Asia and is its largest country, reaching from the Caspian Sea to China. It also shares common borders with Kyrgyzstan, the Russian Federation, Turkmenistan and Uzbekistan. With a total population of 14.8 million spread over more than 2.7 million square kilometres of territory, Kazakhstan is one of the most sparsely populated regions in the world. The ethnic origin of about half of this population is Kazakh. A strong Russian minority is located mainly in the north of the country and other ethnic minorities include Germans, Ukrainians and Uzbeks. Fortunately, tensions among these groups have been less frequent than in neighbouring countries. Kazakhstan is richly endowed with oil, gas and mineral resources.

Roughly the size of western Europe, Kazakhstan's vast area encompasses a broad variety of landscapes and ecosystems. Its environmental problems are equally diverse and often specific to certain locations. The challenge for Kazakhstan's government rests in adopting a differentiated response to these problems while systematically addressing other difficult issues, such as rising mortality rates, slow political transformation and problems of law enforcement. Due to its economic strength, Kazakhstan plays a crucial role for stability in Central Asia. There is a strong link between such stability and the issues surrounding water quality monitoring and water sharing, both with neighbouring Uzbekistan and with upstream states.

Security-relevant environmental risks

The most urgent environmental concerns involving threats to human security in Kazakhstan are centred on water, radiation and waste. The Aral Sea represents a unique disaster with a sequence of devastating environmental and socio-economic effects, but water supply and quality are of concern throughout Kazakhstan and are identified as priority areas by its National Environmental

Action Plan for Sustainable Development (UN ECE 2000a: 12). Radiation derives from large geological uranium deposits and waste from uranium mining as well as the use of Kazakhstan for military nuclear testing by the Soviet Union. Industry also contributes substantially to pollution caused by improper waste treatment and management.

As an Aral Sea state, Kazakhstan is one of the immediate victims of the environmental devastation and collapse of the Sea's ecosystem, which derived from the shrinking of the Sea to almost half its original size due to a reduction in average annual discharge from 50–60 km² before 1960 to only 5 km², if at all, in the 1990s (UN ECE 2000a: 115). The reduction of water volume in the lake is the basis of a chain reaction leading to desertification, land salinization and contamination, air pollution and a dramatic loss of biodiversity. The immediate socio-economic effects of this disaster, such as unemployment, health problems and migration are already having profound impacts on local and regional patterns of life. The impacts of salt and dust storms carrying particles from the previous seabed are felt hundreds of kilometres around. The Aral Sea's Vozrozhdeniye Island history as biological and chemical test site adds a further risk to human health.

Apart from environmental decline in the Aral Sea basin, water supply for agriculture and industry and drinking water quality standards constitute a challenge throughout the country. With the environmental deterioration of the Caspian and the Aral Sea, Kazakhstan remains heavily reliant on river systems for its water supply. The Syr Darya constitutes a vital source of water for both Kazakhstan and Uzbekistan and has led to disputes between these states. Ethnic tensions have also been fuelled by the question of water allocations around the Arnasay reservoir, though the last remaining border issues in this area between Uzbekistan and Kazakhstan were settled in September 2002 (see Box 1).

Environmental concerns are centred on water, radiation and waste

High levels of radioactivity

Another major environmental concern in Kazakhstan derives from its high levels of radioactivity. Natural radioactivity is two to three times higher than the global average (UN ECE 2000a: 77) and the radioactive and toxic pollution associated with former defence industries and test ranges based throughout the country still poses long-term health risks. The seriousness of this issue in the Semipalatinsk region was recognized by the UN (Resolution 52/169 M) in 1997, stating that “radiological, health, socio-economic, psychological and environmental problems” in this area would need the attention of the international community.

The third major environmental concern for human security derives from large amounts of industrial wastes and inappropriate waste management. “By 1998, accumulated hazardous industrial wastes amounted to almost 3 billion tonnes” (UN ECE 2000a: 69). Industry is located mainly in the east of Kazakhstan, where many of its rich natural resources can be found. Improper waste disposal and the large quantity of hazardous

wastes pose a substantial risk of contaminating surface and groundwater by heavy metals (ibid: 72).

These environmental problems pose risks to human health and personal security but do not necessarily trigger violent conflict. However, tension may increase drastically when the environmental pressures accumulate and coincide with declining life expectancy, migration in response to a degrading natural environment, and an increasing discrepancy between economic liberties and a reactionary political culture.

Socio-economic conditions

Kazakhstan has a comparatively strong economy in Central Asia. It is largely dependent on a narrow range of exports: mainly oil, gas and some industrial output (ADB 2002a: 111). Growth of GDP reached 13.2 percent in 2001 compared to 9.8 percent in 2000, and inflation dropped to 8.5 percent (ibid.). Real GDP per capita (in PPP) increased by almost \$900 to \$5871 in 2000 compared to the

**Box 1:
Bagys and the Arnasay
Reservoir – Territorial
disputes resolved**

The village of Bagys, located about seven kilometres north of Tashkent, was at the heart of border disputes between Kazakhstan and Uzbekistan until 2002. These two countries had already signed an agreement on 96 percent of their 2,440 km common border in November 2001, but a stretch including the settlements of Bagys, Arnasay and Nsan, remained unresolved. These areas were left in a legal limbo after leasing agreements made during the Soviet era were contested after the collapse of the Union. The controversy over ownership was fuelled by the mosaic

ethnic composition of the areas and water allocation disputes. Frustrated by the failure of the Kazakhstan-Uzbekistan joint commission to settle its status, the 2000 inhabitant village of Bagys declared independence on 30 December 2001. This move led to the immediate arrest of 30 villagers but also prompted the governments to resolve the issue. The area was already under considerable strain due to its high population density, economic recession, declining living standards and high unemployment. Further disputes over land and water held the potential to

dramatically heighten the risk of open conflict. Following more negotiations, an agreement was finally signed by the Kazakh President Nursultan Nazarbayev and Uzbek President Islam Karimov on 10 September 2002, whereby Bagys and Arnasay are Kazakh territory, and Nsan is Uzbek, reflecting the ethnic majority of these communities. The concession of Arnasay was crucial to Kazakhstan, since it enables access to water.

Sources: ICG 2002a; Eurasianet 2002a, Eurasianet 2002b

previous year (UNICEF 2002). According to Swisspeace's risk assessments "Kazakhstan is the only country in Central Asia whose growing economy is accompanied by a redistribution of wealth in the population" (Swisspeace 2003a: 3). Per capita income in 2001 rose by over 10 percent relative to 2000, which in real terms signified an average monthly wage increase of 9.5 percent (ADB 2002a: 111). The unemployment rate fell by 2.4 percent to 10.4 percent compared to 2000, with women and young adults remaining more affected than other groups. These developments fostered a drop by 3.8 percent in the proportion of people living below the minimum subsistence level of 4637 tenge or \$31 a month in 2001 compared to the previous year (World Bank 2001a). Nevertheless, this group still constitutes more than a quarter of the population. Compared to other Central Asian states, Kazakhstan has some of the lowest levels of poverty (UNICEF 2002).

However, the positive economic trend has yet to have an impact on public health. The general health of the population is deteriorating and HIV and AIDS are spreading rapidly (ibid.). Life expectancy in Kazakhstan has decreased from 67.6 in 1997 to 64.6 in 2000 and is the lowest in Central Asia (ibid.). Despite this development, public expenditure on health amounted to only 1.9 percent of GDP in 2000, which even represents a decline by 0.2 percent from the previous year, despite economic growth (ibid.). Some of the social difficulties, such as the prevalence of HIV and AIDS, are more evident in Kazakhstan since it is the only Central Asian country acknowledging that AIDS is a crisis threatening the entire country (Eurasianet 2003). The educational record of Kazakhstan is more promising, with an adult literacy rate of 98.5 percent in 1998 and a high primary school enrolment for both male and female students (UNICEF 2002).

The government tolerates civil society and non-governmental organizations (NGOs) and their participation is regulated by the Law on NGOs (1996). In 1997, an NGO forum was held

in Almaty and in 2000, 300 active NGOs were registered (UN ECE 2000a: 17). The structural prerequisites for political pluralism are developing in Kazakhstan, with ten political parties registered at the parliamentary election on 10 October 1999. However, the improved legislative and regulatory framework was severely undermined by illegal interference by executive authorities, unfair campaign practices, threats to media operations, intimidation of opposition parties and candidates, as well as widespread violations during vote count and tabulation of results (OSCE/ODIHR 1999: 3). The deficiencies in efforts by the election commissions and courts to adequately address these issues further reveal a lack of democratic culture. Kazakhstan's Freedom House ranking for 1999–2000 concluded 'not free', with a degree of political rights ranking of 6 and degree of civil liberties ranking of 5 (on a scale of 1 to 7, with 7 representing the lowest degree of freedom).

Economic growth and increasing economic well-being cannot compensate for wider social problems, such as declining health standards and life expectancy, weak social security, corruption and the obstruction of opposition and free media. Social problems are intensified by the overall environmental degradation. The combination of unfavourable socio-economic conditions, high environmental stress and weak environmental policies and laws, together with social impacts of market liberalization and the continuing oppression of political freedom, can lead to distress and tensions.

Policies, institutions and capacities

Kazakhstan has taken a long-term approach to environmental policy development in its Strategic Plan Up To 2030 'The Environment and Natural Resources'. More immediate environmental issues are addressed in various sectoral programmes (e.g. the Strategic Water Resource Plan, National Action Plan for

The positive economic trend has yet to have an impact on public health

The educational record of Kazakhstan is promising

Combating Desertification or Forest Programme, all by the Ministry of Agriculture) as well as the National Environmental Action Plan for Sustainable Development (NEAP/SD), which is the definitive policy programme for the environment. NEAP/SD presents an integrated approach towards environmental policy. In addition, a Programme of Ecological Education was jointly approved by the Minister of Science and Education and the Minister for Natural Resources and Environmental Protection in 1999. The relevance of the environment to public health is recognized by the National Programme for Health and Environment, which was also jointly approved by the ministers of health and environment in 1999.

The main institutional responsibility for environmental issues lies with the Ministry of Natural Resources and Environmental Protection, which is staffed with 1,149 inspectors (UN ECE 2000a: 15). The National Environmental Centre for Sustainable Development is mainly responsible for the preparation of the NEAP and its monitoring and has started work on the national Agenda 21 (*ibid.*). The institutional set-up devolves some environmental policy responsibilities to oblast and local authorities, mainly for implementation and monitoring activities that concern their territories. The government has established "rules and procedures for coordinating the activities of line ministries and regional authorities and integrating sectoral knowledge" (*ibid.*). For the implementation of the common National Programme for Health and Environment, the cooperation of environmental inspectors with the Agency for Emergencies and Health and the Agency for Land Resources is based on respective protocols. According to the UN ECE Environmental Performance Review of 2000, "they set up ad hoc commissions, if inspection of a particular site requires it," rather than cooperating in a systematic way (*ibid.*).

Kazakhstan has ratified the three Rio conventions (United Nations Framework

Convention on Climate Change, Convention on Biological Diversity, Convention on Combating Desertification) and has signed the Kyoto Protocol. It has accession status to the Montreal Protocol on Ozone Depleting Substances, the UN ECE Convention on Long-Range Transboundary Air Pollution, is Party to the UN ECE Convention on the Transboundary Effects of Industrial Accidents and has ratified the UN ECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes as well as the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters.

The wide range of legislative efforts and policy programmes does not correspond to the weak institutional structure at the sub-state level. Policy integration and institutional cooperation are still underdeveloped and are far from taking into account the important link between environment and both human and national security. Furthermore, as with most other states in Central Asia, there is a severe lack of financial resources for the implementation of policy programmes and monitoring activities, which are crucial for the development and adjustment of appropriate measures and policies.

Policy integration and institutional cooperation are still underdeveloped

3 Kyrgyzstan

Kyrgyzstan is a land-locked and predominantly mountainous country with an area of 198,500 km², sharing common borders with China, Kazakhstan, Tajikistan and Uzbekistan. Natural resources are limited; however, the mountains store water in their glaciers, an important economic resource. The majority of the 4.8 million population lives away from the mountainous areas in peripheral and often remote areas of the country. The ethnic composition of the region is complex, with over 50 ethnic minorities, mainly Kyrgyz, Uzbek, Tajik and Russian.

High environmental stress, fragile local ecosystems in remote areas, weak governance structures, population pressure, continuing poverty and ethnic tensions are potential sources of – mainly sub-state – tensions and conflict and threats to regional stability. The southern part of the country has suffered most from the economic transformation in the past decade. Kyrgyzstan has experienced occasional tensions prior to and after independence, including the Osh-Uzgen riots. Earlier armed incursions from the Islamic Movement of Uzbekistan (IMU) (today's Islamic Party of Turkestan) in the south of Kyrgyzstan and increased recruitment by the Hizb-u-Tahrir (both fundamentalist Islamic organizations) have led the government to intensify efforts towards social and political stability and economic development.

Security-relevant environmental risks

The most significant environmental problems threatening human development and security in Kyrgyzstan are centred on irrigation for agriculture, and large-scale gold and uranium mining. This has led to the disruption of fragile ecosystems mainly in mountainous regions and cattle grazing areas, diminishing the livelihoods of the rural population in remote areas. Environmental stress in remote areas often entails migration and extreme poverty.

Kyrgyzstan's possession of sufficient water supply, an otherwise rare resource in the

region, comes hand in hand with a considerable responsibility for this resource. This responsibility has not yet been fully appreciated, as "for the time being there is no national strategy for the use of water resources or their protection" (UN ECE 2000b: 78). The question of efficient water management is of concern for the whole region, since most agricultural activity depends on irrigation. Not only Kyrgyzstan depends on water resources for agriculture, industry and hydro-power generation. The downstream countries Uzbekistan, Kazakhstan and important parts of Tajikistan are reliant on the same sources. With the end of the Soviet Union, the previous system of allocation ceased to function, which led to the emergence of newly defined national interests and, ultimately, tensions over the allocation of water. As one consequence of such water conflicts, Uzbekistan has withheld energy supplies for Kyrgyzstan.

The mining of uranium, heavy metals and mercury and the storage of past mining wastes have also become key environmental problems. The National Environmental Action Plan (NEAP) for Kyrgyzstan (1995–1997) specifically highlights Maillii-Suu, where 13 dumps and 23 uranium mining tailings sites are located. The NEAP presents this area "as an example of some of the major problems common at most mining and refining locations in the country" (UN ECE 2000b: 53). At the same time the area presents particularly high risks due to its proximity to human settlements, underground reserves of natural gas and oil, and the "very high probabilities of various kind of natural disasters", such as earthquakes and landslides (ibid: 51). Environmental pollution by these dumps presents potential human health risks, for example by contaminating drinking water and arable soil. These risks are emphasized by Kyrgyzstan's location as an upstream country that feeds a large number of streams in Central Asia. More than 3500 rivers that rise on Kyrgyz territory run further through neighbouring countries (ibid: 69).

Significant environmental problems are irrigation and large-scale gold and uranium mining

Environmental stress in remote areas often entails migration and extreme poverty

Additional environmental pressure results from soil contamination from agricultural practices. Mainly in the remote mountainous areas, poverty and lack of income alternatives force local communities to engage in intensive cattle grazing, which contributes to deforestation and degradation of fragile natural habitats. Highland communities are confronted with shortages in energy supply, such as gas and electricity. As a consequence, they turn to locally available resources, mainly illegal logging for wood fuel. Deforestation increased annually between 1990 and 2000 by 2.6 percent (FAO 2000: 164). Uzbeks and Tajiks are using border territory for grazing and arable farming. Some have meanwhile built permanent settlements. This is causing elevated environmental pressure and potential for conflict. Forest decline is leading to constraints of water supply and food availability, which is posing significant threats to human security on the southern and northern slopes of the Ferghana Valley. Mailii-Suu on the northern side of the Ferghana Valley and the upland communities around the Valley are hot spots of environmental decline with associated socio-economic impacts. Here only 19 percent of the rural population has access

Forest decline is leading to constraints of water supply and food availability

to piped drinking water and there is little space for dwellings (ADB 2002b).

A high level of environmental pressure does not necessarily lead to violent conflicts. However, scarce natural resources (mainly water and fertile land) pose significant threats to human security and regional stability if environmental stress is combined with unfavourable social, economic and political conditions such as an overall lack of democratic political culture, a weak governance structure, poverty, mass migration, high unemployment, demographic pressure, incursions of Islamic extremists and ongoing border disputes (Box 2 presents the example of Ferghana Valley).

Socio-economic conditions

Kyrgyzstan undertook economic and social reforms early after independence in 1991. Positive signs of macro-economic stabilization seem to continue. GDP rose by 5.3 percent in 2001, and the monthly rate of consumer price inflation dropped from 18.7 percent in 2000 to 6.9 percent in 2001 (ADB 2002a: 116). Annual GDP growth until 2004 is expected to remain at 4.5 percent, slightly lower than the 5 per-

Box 2: Ferghana Valley – Ethnic tensions and artificial borders

The Ferghana Valley stretches over three Central Asian countries – Kyrgyzstan, Tajikistan and Uzbekistan – and is divided by seven enclaves. The Kyrgyz part makes up 40 percent of the area and 51 percent of the population of Kyrgyzstan. With the collapse of the Soviet Union, the Ferghana Valley became divided among the Central Asian states, in a situation characterized by linguistically distinct populations, artificial borders, and disruption of social and economic structures. Uzbekistan has mined its borders with Kyrgyzstan and Tajikistan in the Ferghana Valley and along the margins of the Uzbek enclave of Sokh. People in the Valley are faced with unfavourable environmental and socio-economic conditions. It is one of the most densely populated areas where communities are exposed to a high level of environmental pressure: 20 percent of Central Asia's population lives in the Ferghana Valley, which makes up only 5 percent of the territory of

Central Asia. Overpopulation due to high growth rates and one of the highest fertility rates in Kyrgyzstan has often resulted in conflicts over limited land and water resources, combined with inter-ethnic tensions. Since the late 1980s, several communities have experienced ethnic clashes triggering widespread violence.

Sources: UN FVDP 2000;
Tabyshaliev 1999

cent target of the National Poverty Reduction Strategy (ibid: 117). The value of the national currency has remained almost unchanged since 2000. GDP per capita (in PPP) grew from \$2250 in 1997 to \$2711 in 2000 (UNICEF 2002). However, growth prospects are constrained by the low level of diversification and the economy's reliance on volatile gold markets. Between January and September 2002, industrial output declined by 17.3 percent, basically induced by a decline of the mining sector. The country's largest gold mine in Kumtor alone accounts for roughly 9 percent of GDP (Community Business Forum Kyrgyzstan 2003).

Due to high income inequalities the generally positive macro-economic development has not yet led to an increase in the quality of life for most of the population. According to the World Bank, 48 percent of the total population lives below the national poverty line (World Bank 2001b). The rural population is most affected with 56.4 percent living in poverty in 2001, this ratio reaching up to 81.4 percent in the districts of Batken, Jalal-Abad, Talas and Naryn (ADB 2002b). The minimum wage is \$2 a day, and staggering hyperinflation in the early post-independence period wiped out the lifetime savings of most families. The cost of living increased by 17 percent in 2000 alone, and the social security system has largely collapsed. Even basic necessities such as gas and electricity have become increasingly out of reach for many families (ICG 2001: 14). A heavy burden of external debt (reaching 130 percent of GDP in 2001) and a weak banking sector threaten economic and political reform.

The Human Development Index remained stable over the past four years with a slight increase in 2000. But poverty and marginalized development opportunities particularly jeopardize stability in the south where isolation, border disputes, lack of investment, and ethnic differences remain critical. Estimates for the unemployment rate in 2000 are at 7.5 percent, while the actual rate is

considerably higher due to hidden unemployment, especially among younger people (ADB 2002a: 115). Growing unemployment, rising costs and stagnant wages led to modest protests in 2000 and 2001 in Bishkek, Naryn, and Jalal-Abad (ICG 2001: iii).

Mass migration poses additional threats to security, with thousands leaving the impoverished southern regions because of the lack of fertile land, unemployment and poverty. Serious consequences are expected with regard to unresolved border disputes if settlements in border regions are abandoned and economically marginalized, while Uzbekistan is focusing investment in these border regions (Jumagulov 2003).

Civil society in Kyrgyzstan is developing, although the country's Freedom House rating on civil liberties and political rights declined from "partly free" to "not free" in 2001 (Freedom House 2002). Nevertheless, civil society groups and media increasingly influence government policy and legislation. Parliament is a progressively active and responsive balance to government. Local elections in over 460 villages and cities represented the first direct local elections in Central Asia. However, the presidential and parliamentary elections held in 2000 did not meet international standards, since the opportunity for particular political parties and candidates to be represented in the new parliament was systematically undermined (OSCE/ODIHR 2000a: 1). Concerns among international experts were also raised about the first referendum which took place in February 2003. Constitutional changes will increase the president's power in relation to the parliament and constitutional provisions may limit human rights (OSCE/ODIHR 2003: 1)

Government-supplied social services, critical to maintaining public support for reform, are still inadequate. Public expenditure on health declined from 1992 to 1999 from 3.4 to 2.1 percent of GDP (UNICEF 2002). Widespread poverty and very limited prospects for economic growth will continue to influence

Growth prospects are constrained by the low level of diversification and the economy's reliance on volatile gold markets

**Kyrgyzstan's
educational system is
yet in a poor state**

both the general health status and the operations of the new health care systems as well as people's attitudes towards transition. While it has embarked on educational reform, Kyrgyzstan's educational system is yet in a poor state characterized by mis-investment and misgovernment (USAID 2003).

With the environmental context already constituting considerable pressure, conflicts can be triggered by corruption in combination with comparatively low economic growth, income inequalities, population pressure, poverty and unemployment, migration, suppression of opposition forces and media, income inequalities, the decline of social infrastructure (social security, pension, education and health systems), ethnic tension and drug trafficking. In the Ferghana Valley, overpopulation is leading to conflicts over limited land and water resources, combined with inter-ethnic tensions. Since the late 1980s, several communities have experienced ethnic clashes triggering widespread violence.

Policies, institutions and capacities

Officially, no connection between environmental stress and conflict is made by governmental institutions, parliamentarians,

civil society groups or the scientific community. However, stakeholders at the sub-national level seem to be aware of these risks.

The management of natural resources and environmental policy is spread widely across several ministries and agencies. With the Ministries for Ecology and Emergencies being merged, environmental considerations have declined. Major tasks of environmental state agencies such as the state forestry service responsible for natural resources and nature conservation are treated separately from important issue areas such as air pollution, industrial pollution, and land and water resources, which belong to the Ministry for Emergencies. Even though economic incentives for environmental protection exist, they mainly serve fiscal purposes and do not encourage sustainable resource use.

Responsibilities to address socio-economic impacts of environmental stress are spread widely across several institutions, such as the Ministry for Emergencies (humanitarian aid and relief during natural disasters), the state sanitary inspection and supervision service (sanitation), oblast water basin departments (water), state registrar (arable land), various state programmes such as "Araket" (poverty) and the state migration service.

**Box 3:
Water cooperation on
the Chu and Talas rivers**

The governments of Kyrgyzstan and Kazakhstan requested assistance to the UN Economic Commission for Europe (UNECE) and the UN Economic and Social Commission for Asia and Pacific (UNESCAP) to establish an intergovernmental transboundary water commission aimed at effectively implementing the intergovernmental water agreement on the Chu and Talas rivers. The Organization for Security and Cooperation in Europe (OSCE) has been invited to assist in the facilitation of this project, which started in early 2003. The project intends to establish good governance in managing shared water resources between Kyrgyzstan and Kazakhstan through developing institutional arrangements, policies and procedures as well as capacity building activities. The project includes negotiating and establishing rules and procedures of operation of the joint commission to be adopted by the parties as

well as an analysis of the water resources and policy recommendations for developing economic instruments for sustainable water management. This pilot project may serve as an example for improved cooperation on transboundary waters in the region, thus contributing to enhanced regional cooperation.

Source: OSCE 2002

Environmental impacts on public health are rarely assessed and monitored by the Ministry for Emergencies and Ministry for Public Health. Both lack technical capacity and sufficient institutional mechanisms for coordination. Even though provisions for the integration of environmental considerations into other policy areas (health, agriculture, etc.) exist, policies and measures are poorly developed and lack implementation. Policy coordination is predominantly restricted to formal consultation with the parliament on presidential decrees. Institutional arrangements and mechanisms for integrated environmental assessments and policy monitoring for cross-sectoral issues exist, but implementation has yet to be improved. The comprehensive development framework 2001 aims to improve the legal basis for environmental policy and suggests decentralizing strategies for environmental protection in mountainous areas (ADB 2002a).

There are initial attempts to include environmental considerations into security concepts and agencies. In August 1997 the National Security Service adopted Decree No. 3 on "Projecting of concepts and measures on providing ecological security." The Presidential Decree No. 221 on "Concepts of National Security", adopted on 13 July 2001, also includes environmental issues, among economic, political, social, and military threats. The strategy is to be implemented by local police forces, the Ministry for Ecology and Emergencies and the National Security Services.

Kyrgyzstan has ratified the United Nations Framework Convention on Climate Change and has accession status to the Convention on Biological Diversity, the Convention on Combating Desertification as well as the Montreal Protocol on Ozone Depleting Substances, the UN ECE Convention on Long-Range Transboundary Air Pollution and the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters. However, financial and technical capacities to

effectively implement these conventions through domestic programmes and projects are absent. Here, the government basically relies on external funding from various donor agencies.

Officially, no transboundary efforts on environmental cooperation have been initiated to specifically promote stability and peace, but there are some projects which address transboundary cooperation, such as the recent initiative on water cooperation on the Chu and Talas rivers (see Box 3). The government of the Kyrgyz Republic is also addressing a transboundary environmental project in Gorno-Badakhshan. The Swiss government is currently supporting a water management project in the Ferghana Valley, on water allocation and utilization among the neighbouring countries. Biodiversity conservation across borders is promoted through the West Tien Shan Interstate Biodiversity Project (funded through TACIS) and operates in Sary-Chelek and Besh Aral (Kyrgyz Republic), Aksu Djabagaly (Kazakhstan), and Chatkal (Uzbekistan). Even though transboundary environmental cooperation is officially promoted, practical implementation of projects still requires assistance.

Environmental impacts on public health are rarely assessed and monitored

Policy coordination is predominantly restricted to formal consultation

4 Tajikistan

The country fell into a civil war lasting from 1992 to 1997

Tajikistan lies in the south-east of the Central Asian region, sharing borders with Afghanistan, China, Kyrgyzstan and Uzbekistan. With 93 percent of Tajikistan's 143,100 km² total area considered mountainous, more than half of its territory lies at a height of at least 3000m above sea level and includes some of Central Asia's highest peaks. Frequent earthquakes of varying degrees and natural disasters are reported. The 6.7 million population consists of a 67 percent Tajik majority with a strong Uzbek minority of 23 percent; 70 percent of the population lives in rural areas. After independence in 1991, the country fell into a civil war lasting from 1992 to 1997 between old-guard regionally based ruling elites, disenfranchised regions, democratic liberal reformists, and Islamists who were loosely organized in a United Tajik Opposition. As a result, not only the economic, social and political transformation was slowed down but the country also suffered significant damage to the energy and agricultural infrastructure and the social security system. Frequent outbreaks of violence make Tajikistan a rather unstable country.

Tajikistan is characterized by ongoing degradation of land resources and limited availability of clean water

Tajikistan is characterized by ongoing degradation of land resources and limited availability of clean water, a slowly stabilizing economy, enormous social problems and insufficient state capacity relying on external assistance. In contrast to some other Central Asian countries, scarce water resources are not a general concern due the mountainous profile of Tajikistan. However, there is a high susceptibility to natural disasters due to a very high dependency on hydropower and agricultural production.

Security-relevant environmental risks

The major environmental problems of Tajikistan are the impacts of natural disasters, increasing land degradation, and limited availability of clean drinking water, all of which are mutually reinforcing. The UNICEF Multiple

Indicator Cluster Survey 2000 found that just 57 percent of the population has access to safe drinking water (UNICEF 2000). In addition, the negative developments with regard to deforestation, desertification and the deterioration of wildlife and protected areas, especially during the civil war, need mention. Among the natural disasters are on the one hand earthquakes, landslides, mudslides and flash floods, which were responsible for 200 people killed and damage estimated at several million US dollars in the second half of the 1990s and which affect Tajikistan each year (ADB 2000: x). On the other hand the country faces frequent droughts, which have negative impacts for hydropower and agricultural production. Since the population is concentrated in particularly vulnerable areas the negative impacts on people and their livelihoods are further increased. The government is largely unprepared for these events due to a reactive approach towards dealing with crises, as well as a lack of financial resources and investment in preventive activities that might reduce risks and social vulnerability.

The agricultural and industrial use of the mountainous land and lowland plains in the west of the country has led to land erosion and salinization problems. The problem of land erosion is leading to a process of desertification, especially in mountain regions. This affected about 60 percent of the irrigated lands at the turn of the century (ADB 2000: xi). Salinization of land has become a widespread problem, caused partially by the high degree of mineralization of water used for irrigation and partially by poor irrigation practices. While only 7 percent of Tajikistan's territory is arable, agriculture nevertheless plays a key role for the economy. Additional contamination of land derives from uranium mining waste with negative health impacts. In some areas radiation levels exceeded safety standards up to tenfold.

The mountainous profile of Tajikistan ensures that water quantity is not a major concern in this country. But as an upstream

country, Tajikistan has responsibilities towards lower level countries. Despite a generally high quality of water, drinking water standards are not always met, with poor sewage treatment and informal garbage dumps contaminating the water. Only 21 percent of treatment facilities operated satisfactorily in 1998 (ibid.). In addition, salinization of land, use of pesticides and mining discharges have negative impacts on fresh water.

The effects of the adverse environmental conditions are widely felt by the population: "Each of the major impact groups – human health, human welfare and environmental resources – are adversely affected by environmental degradation and depletion of natural resources," the Asian Development Bank states (ibid: 60). Waterborne diseases, such as typhoid, cholera and leptospirosis, increased tremendously in the 1990s. Outbreaks of typhoid intensified in 1995 and 1996 when 6000 people died, which is more than 10 percent of the number of civil war victims (ibid.). Another consequence of the water contamination is an increase of the morbidity

of people. Despite international agencies providing chlorine in order to control typhoid, negative impacts could not be prevented. The government was not able to respond appropriately due to a lack of resources.

The issue of water pollution has gained a transboundary dimension by becoming a point of contention between Tajikistan and Uzbekistan. Water quality is also an issue in other transboundary contexts (at the Syr Darya and Zeravshan rivers). Monitoring stations are essential to assess the extent of the problems. A regional Global Environment Facility-funded project is establishing 26 monitoring stations in the region – five of them in Tajikistan – at critical points to measure transboundary water pollution. The Governments are also making an effort to engage in constructive policy dialogue and exchanges among policy makers and scientists occur frequently (ibid: 15–16). Another example of Tajik-Uzbek cooperation on transboundary environmental issues is the Tajik Aluminium Plant in Tursunzade, described in Box 4.

Waterborne diseases increased tremendously in the 1990s

The Tajik Aluminium Plant, Tadaz, in Tursunzade is one of the largest smelters in the former Soviet Union and is located only 10km from Uzbekistan's south-eastern border. Its annual discharge is around 40,000 t of harmful substances, of which 300–400 t are extremely dangerous hydrogen fluoride. The emissions are heavily polluting the area around Tursunzade as well as the Uzbek oblasts of Kashkadarya and Surkhandarya, contaminating soils and crops as well as livestock. The human health impacts are alarming, with the affected regions recording high

incidences of disorders of blood and hematopoietic organs, the musculoskeletal system, birth defects and tumours. In order to address the situation appropriately, the governments of the Republic of Uzbekistan and the Republic of Tajikistan signed an Agreement on Cooperation in Improving the Environmental Situation in the Zone Affected by the Tajik Aluminium Plant in November 1994. The agreement was the basis for cooperation between the Uzbek and Tajik national environmental protection agencies and a joint draft programme of scientific and technical mea-

asures to improve environmental conditions at the plant between 1996 and 2000. In 1998 the factory installed air pollution control devices in an effort to reduce harmful emissions. Implementation of other substantial measures is still lacking. Nevertheless, Tajikistan and Uzbekistan have recognized the security relevance of this issue and are cooperating to address the problem jointly.

Sources: ADB 2000; Fluoride Action Network 2003

Box 4:
Transboundary environmental cooperation – Tursunzade Aluminium Plant

Socio-economic conditions

Tajikistan is still recovering from the legacy of the civil war, which significantly impeded economic development. The 1997 peace agreement brought a turnaround in GDP and this trend accelerated in 2001, when GDP growth rose to 10 percent from 8.3 percent (ADB 2002a: 119). The inflation rate dropped below 10 percent in 2002, after being constantly between 30 and 40 percent from 1997 to 2001 (UNICEF 2002). These improvements of the overall macroeconomic conditions are attributed to a substantial increase in aluminium production and an expansion of agricultural production, despite continued drought conditions. At present, the agricultural sector contributes around 20 percent to GDP and accounts for more than half of employment (ADB 2002a: 118). Hence the sector is a crucial factor for the overall development of the Tajik economy, not only in terms of privatization processes but also with respect to the provision of rural finance for non-cotton activities with the aim of diversifying agricultural production.

Tajikistan is rich in natural resources, namely minerals (gold, silver, and uranium), water and hydropower. It is the world's third largest producer of hydropower and 90 percent of the energy generating capacity of the country is hydroelectric, with the most important hydroelectric stations located on the Vakhsh (US DoE 2002). A major portion of this hydroelectric capacity is used in aluminium production, which consumes 40 percent of all the country's electricity and is the main export good. According to the US Department of Energy there is a greater hydroelectric power capacity in Tajikistan than in any other country in Central Asia. At present only 5 percent of this capacity is used (ibid.). New hydropower plants and the respective transmission and distribution lines are currently supported by the Asian Development Bank. Tajikistan is a net importer of oil and gas although the country has own

deposits of both resources. There has been a long period of decline in oil production since 1992, due to the civil war impacting negatively on the economy and a resulting lack of investment in infrastructure.

Despite resistance from vested interests, the government continued to pursue macro-economic stabilization and structural reform at the beginning of the new century. The Asian Development Bank sees the external debt repayments as the greatest danger to the economy. In 2001, 1.7 percent of GDP was scheduled for servicing external debt compared to 0.3 percent in 2000 (ADB 2002a: 119). In addition, annual GDP growth is expected to be less dynamic in 2002 and 2003. The economy remains highly dependent on foreign trade with cotton and aluminium responsible for more than 80 percent of export earnings (ibid.). As in 2001, fluctuations in international prices could cause shifts in the terms of trade, impacting seriously on the overall economic performance of the country. In addition, the global oversupply of aluminium is likely to lead to a reduction of its price in the future. Additional risks arise from the further occurrence of droughts, causing a rise in wheat and power imports.

These risks need to be seen in the light of the country's overall social conditions. Tajikistan is the poorest among the countries of the former Soviet Union and one of the poorest countries in the world. According to World Bank statistics 80 percent of the population lived under the poverty line in 2001 (World Bank 2002). There has been no noteworthy increase in GDP per capita (PPP) since 1997, which figured \$1152 in 2000 (UNDP 2002). The overall economic growth of the past years has not led to an improvement of the employment rate or the level of poverty. United Nations statistics indicate that the employment rate dropped continuously from 72 percent in 1990 to 54 percent in 2000 (UNICEF 2002). As a result, an estimated 200,000 people left the country in search of work in 2001, most to the Russian Federation,

Tajikistan is the world's third largest producer of hydropower

Tajikistan is the poorest among the countries of the former Soviet Union

while local estimates even consider 1 million Tajik people to be seasonal labour migrants (ADB 2002a: 118). Social grievances are also reflected by the highest under-five mortality and infant mortality rates among the Central Asian countries (UNICEF 2002).

Many of the current problems of Tajikistan were caused by the long-lasting civil war of the nineties, which inhibited major reform steps to foster economic restructuring, social well-being and increasing state capacity. These challenges need to be addressed against the background of poor political conditions. Both Tajikistan's presidential and parliamentary elections, in 1999 and 2000, respectively, were widely considered to be flawed and unfair but peaceful (OSCE/ODIHR 2000b: 2–3). Moreover, government still restricts press freedom as well as the freedom of assembly and association, although both are provided by the Constitution (*ibid.*). This overall political situation is also reflected in the Freedom House's rating of the country's performance on political rights and civil liberties which is considered as 'not free' (Freedom House 2002). However, the inclusion of a declared Islamic Party and several other parties in the parliamentary elections represented an improvement in citizens' right to choose their government. Other challenges for the government comprise the demobilization and reintegration of former opposition troops and the building of public trust in the banking sector.

Policies, institutions and capacities

According to Article 36 of the Constitution of the Republic of Tajikistan "the state guarantees the right of citizens to a favourable environment." As a basic environmental policy measure, the Law on Nature Protection was adopted in 1994 accompanied by the State Ecological Programme (1996) and the State Programme on Environmental Education (1997). Since the beginning of the new century a number of environmental plans

have been adopted that specifically deal with growing environmental concerns such as desertification, biodiversity or public health protection. Most recently, a law on Ecological Expertise has been passed.

The Ministry of Nature Protection is in charge of environmental management and is assisted by 11 offices providing administrative and technical support. In addition, other ministries such as the Ministry of Emergency Situations and Civil Defence, the Ministry of Agriculture and the Ministry of Water Resources play an important role in environmental policy-making. However, due to a lack of coordination for environmental protection among these ministries, the implementation of policies is not yet effective. Moreover, the size of the Ministry of Nature Protection decreased from about 900 in 1991 to less than 250 at the end of the century. The insufficient number of staff is also due to a significant reduction of funding in the course of the civil war and resulted in serious institutional weaknesses (ADB 2000: xii). This situation is reinforced by weaknesses in terms of policies and legislation. Fees, taxes and fines to prevent environmental damage are not effective since they are too low to encourage compliance. In addition, the instrument of environmental impact assessment authorized under the basic Law on Nature Protection has not yet been passed into law despite intensive lobbying efforts.

Several bilateral agreements indicate that the connection between environmental stress and conflict is taken seriously by Tajikistan. The agreements between Uzbekistan and Tajikistan on issues of pollution from the Tajik Aluminium Plant in Tursunzade and Uzbek Bekabad's metallurgic and cement plants as well as the joint statement made by the governments of Tajikistan and Kyrgyzstan on the water conflict in Isfara district show that the foreign policy dimension of environmental pollution is tackled more effectively than the root causes themselves.

Tajikistan has ratified the United Nations

Several bilateral agreements indicate that the connection between environmental stress and conflict is taken seriously by Tajikistan

Framework Convention on Climate Change and has accession status to the Convention on Biological Diversity, the Convention on Combating Desertification as well as the Montreal Protocol on Ozone Depleting Substances and the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters. However, implementation of the respective environmental goals depends mainly on assistance by external donors.

Mechanisms to involve the public in respective policy processes need to be elaborated

Although the country is signatory to the Aarhus Convention and the Law on Nature Protection allows public participation, mechanisms to involve the public in respective policy processes need to be elaborated. The Law on Public Organizations makes no reference to participation in policy development. However, there is already a fair in-

volvement of experts and scientists, and activities of NGOs are growing. In 2000, 42 environmental organizations were registered, ten of which are considered active (ADB 2000: 82). Half of the active organizations are involved in country-wide activities. The main focus of the NGOs lies in the field of environmental education and training but also information sharing and networking.

5 Turkmenistan

Turkmenistan lies in the south-east of Central Asia, to the west of the Caspian Sea. It reaches furthest south of all countries in Central Asia, bordering with Afghanistan, Iran, Kazakhstan and Uzbekistan. It has a total area of 488,100 km². Turkmenistan possesses large reserves of natural gas and substantial deposits of oil. The country is characterized by aridity, incorporating the Kara-Kum desert, one of the largest sand deserts in the world. With 4.7 million inhabitants, Turkmenistan has the smallest and ethnically most homogeneous population of the Central Asian republics, with Turkmens representing the vast majority. It has been largely free of inter-ethnic hostilities, even though tribal allegiances are potential sources of tension. Turkmenistan is headed by the autocratic president Saparmurat Niyazov. The country is rather impoverished and has remained largely closed to the outside world since independence in 1991.

Turkmenistan is characterized by limited water availability and water bodies polluted by agricultural and industrial effluent, a relatively closed and centralized economy, limited political rights and civil liberties and a lack of transparency and participatory elements in policy-making. The resource conflicts and ethnic tensions occurring in many other Central Asian states are not in evidence. High economic growth and subsidies for basic commodities compensate demands of the poorer part of the population.

Security-relevant environmental risks

Natural habitat transformation, biodiversity loss, soil erosion and salinization, use of rivers for irrigation and human activities, water and soil pollution by pesticides and the building of dams have all contributed to environmental degradation in recent years. The depletion of Turkmenistan's biodiversity is occurring in connection with human-induced desertification of oases and mountain landscapes. Environmental degradation is boosted in

connection with dropping groundwater levels and water losses from the Kara-Kum canal due to increased irrigation for urban and industrial use (Ladonina 2001:19). Overuse of fertilizers and pesticides for agricultural crops has led indirectly to health impacts upon the population.

Domestic and industrial wastewater is discharged to the deserts, affecting groundwater locally. Agricultural drainage water, which is discharged to rivers without control, has increased the levels of minerals, phenols, pesticides and other chemicals in water bodies. As a result, the rivers have reached dangerously high concentrations of salts and chemicals, especially in lower reaches. Drinking water quality is therefore a major problem in many regions of Turkmenistan (Ministry for Natural Resource Use and the Environment 1998). The local population in the Dashkhovuz province south of the Aral Sea has suffered from hepatitis and intestinal diseases due to polluted drinking water and the region has been declared by a presidential decree as an ecological disaster zone (ibid.).

The water scarcity has an immediate influence on the natural environment and human living conditions and a secondary impact on agricultural productivity. Turkmenistan has experienced tensions with Uzbekistan over water allocations from one of the most important water sources in the region, the Amu Darya, flowing through the eastern part of the country. At the same time, this crucial water source has been regularly listed among the most polluted water bodies in Central Asia. The pollution penetrates adjacent land, where the river's water is used for agricultural irrigation, reducing the quantity and quality of food production. The combination of these issues poses considerable risks to the health and well-being of the population, which is necessarily concentrated around the available water sources.

Cotton is at the heart of a system of political and social control that has remained unchanged since independence. Turkme-

Rivers have reached dangerously high concentrations of salts and chemicals

Cotton is at the heart of a system of political and social control

**Turkmenistan
considers irrigation a
key security issue**

nistan is the tenth largest cotton producer and 50 percent of its irrigated land serves cotton production. The agricultural sector is almost completely dependent on water from the Amu Darya and its tributary rivers Murgab and Tedgen. As cotton is vital for foreign exchange and political patronage, the kind of reforms needed to reduce water use – particularly privatization of farming and realistic pricing of water to encourage conservation – have never been initiated. Due to its reliance on agriculture Turkmenistan considers irrigation a key security issue (ICG 2002b: 2).

Water consumption is expected to increase significantly, since cotton production is planned to triple by 2010 and harvesting also to grow. To match the ever increasing demand for water for irrigation, Turkmenistan is planning the Golden Century Lake, a vast artificial lake fed by agricultural run-off in the middle of the Kara-Kum desert (see Box 5).

Socio-economic conditions

Turkmenistan is a potentially wealthy country with large reserves in natural gas and an extensively irrigated agricultural system. After several years of economic decline after independence, the economy began to recover

in the late 1990s when GDP grew by 7 percent due to increased agricultural production and renewed gas sales. Production of natural gas only represents half of its total production capacity and is planned to increase by 40 percent in 2002 (ADB 2002a: 123). Economic data varies considerably among sources. The inflation rate is below 20 percent. Monetary policy measures brought down inflation from 23.5 percent in 1999 to 7.4 percent in 2000 (6 percent in the first half of 2001) (ibid: 122). Domestic statistics show annual GDP growth between 17 and 18 percent in recent years, based on increased gas sales and large public investment. Annual GDP growth is expected to reach 11 percent in 2002 and 2003, with the official target being 18 percent (ibid.)

However, economic growth masks the country's very limited reform progress since independence. The banking sector – mainly public sector banks and government – remains underdeveloped. The economy is characterized by a dominant role of the state in the economy and its maintenance of an extensive system of regulations and controls over trade and industrial activity. Poor economic management is evident, with practically all sales of cotton and wheat regulated by the state.

**Box 5:
Dropped in the desert –
the Golden Century Lake**

Turkmenistan recently announced a plan to build over the next 10 years a 3460 square kilometre Golden Century Lake, a vast artificial reservoir fed by agricultural run-off in the middle of the Kara-Kum desert. It is expected to guarantee water security and create some 4000 square kilometres of farmland capable of growing 450,000 tonnes of cotton and 300,000 tonnes of grain annually. Scientists' fears that this large-scale infrastructure project will wreck the already

fragile ecosystem and that water will simply evaporate in the middle of the desert are denied by the government. These plans have provoked concerns in neighbouring Karakalpakstan. Turkmenistan is already taking a third of Amu Darya's water, which is mostly lost in the desert due to the unpaved nature of the Kara-Kum canal, running 1100 km through the desert, thus being the largest irrigation canal in the world. There is also an ethnic dimension to the

project, since there are fears, especially among the Uzbek minority, that there will be resettlement of people to the vicinity of the lake once the project is completed. Unilateral decisions on water management leading to overuse of already limited resources, such as the Golden Century Lake, may pose risks to regional stability.

Source: ICG 2002b

The export dependent economy is largely based on natural gas and cotton. The Russian Federation, Ukraine and the CIS are the recipient of 88 percent of Turkmenistan's natural gas exports. Exports grew in 2001 by 9 percent, due to increased demand, a new gas pipeline to Iran and re-sales through the Russian Federation to the CIS (ibid: 121). Industrial production (mainly gas and oil) increased by 27 percent. Cotton exports grew by 7 percent in 2001 (ibid.). The government embarked on structural agricultural reforms to increase grain production to self-sufficiency level, but success in this is not yet evident. Rural development is critical as rural regions account for 26 percent of GDP and are a source of livelihood to 54 percent of the population.

GDP per capita (in PPP) grew from \$2109 in 1997 to \$3956 in 2000 (UNICEF 2002). Even with high levels of income inequality, poverty incidence is rather low according to domestic statistics. These indicate that only 1 percent of the total population lives below the relative poverty line (defined as the proportion of the population living on less than 50 percent of the country's average per capita income). However, the World Bank also states that half the population lives on less than the minimum wage and poverty is increasing among the most vulnerable segments of the population (World Bank 2002a). On the other hand, poverty and marginal development opportunities, particularly in arid areas, have been offset by heavy subsidies for basic commodities (water, energy, bread). Nearly 80 percent of total annual public expenditure has been allocated to social and public services. No data is available on unemployment and the functioning of the social insurance system established by law in 1991.

Widespread poverty, heavy foreign debt, and the unwillingness of the government to adopt market-oriented reforms are major constraints to economic development in the near future.

The country's Freedom House rating has consistently been "not free" as civil liberties

and political rights are violated significantly. Media and communication is monopolized and controlled by the state (Freedom House 2002). The political system is characterized by patronage and corruption, a highly restrictive visa regime, control and suspicion of civic action and the media, and state control over, and distortion of, the economy. Turkmenistan is headed by the autocratic President Saparmurat Niyazov, who has been appointed president "without term of expiration of his mandate" in 1999, by an unanimous decision of the People's Council, a body including central and local government authorities, the parliament and state-controlled civic organizations.

Widespread poverty will continue to influence both health status and the operations of the health care system. The infant mortality rate is high, with 74 deaths per 1000 live births (UNICEF 2002). According to the results of the 2000 Turkmenistan Demographic and Health Survey, 47 percent of women and 36 percent of children are anaemic. The educational system has undergone major reforms and succeeded in raising the literacy rate to 99.6 percent. However, it has been seriously affected by the reduction of the number of compulsory school years from 10 to 9, which prevents students from being eligible for institutions of higher education in the rest of the former Soviet Union, as well as by cuts in the budget and the subsequent dismissal of some 10,000 school-teachers in 2000. Moreover, curricula are undergoing an increasing ideologization, with the Ruhnama, a moral and spiritual code officially written by the President himself, playing a central role at all levels of the educational system. Population has grown by 2.5 percent annually with a comparatively high fertility rate of 33 births per 1000. The Human Development Index for Turkmenistan increased between 1996 and 2000 (UNDP 2000). However, this increase mainly resulted from GDP growth, without significant improvement of the economic or general living

Civil liberties and political rights are violated significantly

Turkmenistan is a potentially wealthy country with large reserves in natural gas

conditions. UNDP no longer publishes a national human development report since 2000 because the Programme is not satisfied with the data provided by the government.

Policies, institutions and capacities

Basic environmental policy measures are the National Environmental Programme and the National Environmental Action Plan, both of 1998. Basic environmental laws have been created in the aftermath of independence including the codes on land, responsibility for ecological violations, sanitation, forests, air pollution and fauna.

The management of natural resources and environmental policy is mainly concentrated in the Ministry for Natural Resource Use and Environment Protection. Even though economic incentives for environmental protection exist, they mainly serve fiscal purposes and do not encourage sustainable resource use. Policy integration seems to remain at a very provisional level and substantial information is not available.

Officially, government institutions, parliamentarians, civil society groups and the scientific community make no connection between environmental stress and conflict. Even though the Presidential Programme "Strategy for Social and Economic Development for the Period 2000–2010" mentions "ecological security" as one key target, it mainly considers securing environmental assets. Substantial transboundary efforts in environmental cooperation have not been initiated, even though the international donor community is pushing for cooperative efforts to promote stability and peace in the region. For instance, the Turkmen government did not publicly acknowledge or discuss the issue of water shortage in 2002, when its neighbouring states sought relief for a drought that had been affecting the region for several years.

Turkmenistan has ratified the United Nations Framework Convention on Climate Change, the Kyoto Protocol and the Con-

vention on Combating Desertification. It has accession status to the Convention on Biological Diversity, the Montreal Protocol on Ozone Depleting Substances and the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters. However, financial and technical capacities to effectively implement these conventions through domestic programmes and projects are absent. Here, the government basically relies on external funding from various donor agencies. On the other hand, some projects have indeed been conducted to implement obligations under global environmental conventions, such as the GTZ (German Technical Cooperation) funded pilot project on participatory resource management, introducing sustainable land use practices and fostering inter-communal learning in agricultural practices (Bensmann 2002: 19).

Public participation is guaranteed by the Environmental Protection Act which contains several legal provisions for public associations, access to the legislative process, filing environmental complaints, access to information and public participation in decision-making. Turkmenistan is a signatory to the Aarhus Convention and the OSCE has facilitated a workshop with several local environmental NGOs on its implementation. However, the 1998 State of the Environment report lists only three basic public environmental organizations: the Society of Natural Protection of Turkmenistan, the "Katena" Ecological Club in Ashgabat and the Ecological Club in Dashk-hovuz. The lack of government tolerance has led NGOs to focus on non-contentious issues. However, NGOs such as water user associations have taken up issues at the local level to some effect. In 1993–1994 a cooperation of local greens and international NGOs succeeded in stopping organized poaching of large game and endangered species in nature reserves (Watters 1999: 91).

Policy integration seems to remain at a very provisional level

The lack of government tolerance has led NGOs to focus on non-contentious issues

6 Uzbekistan

Uzbekistan is located at the heart of Central Asia, surrounded by Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan and sharing a common border with Afghanistan in the south. Its total area of more than 477,400 km² embraces landscapes ranging from steppe and desert in the west, to richer farmland along the country's three major rivers towards the mountainous region in the east. Uzbekistan holds a variety of resources, including natural gas and oil, gold and silver and has by far the largest population in Central Asia, counting roughly 25 million people. The majority of the population is ethnic Uzbek, though several substantial minorities, including Kazakhs, Karakalpaks, Tajiks and Turkmens, are part of this multi-ethnic state.

With the Aral Sea and Ferghana Valley, Uzbekistan is directly confronted with two major hot spots in Central Asia, posing significant threats to human development and regional stability. Environmental stress triggers social and economic decline and vice versa, resulting in political and social tensions or even open violent conflict, as in the Ferghana Valley. The supply and quality of water, ethnic tensions, weak capacities and slow economic and structural reforms accumulate to heighten security concerns.

Security-relevant environmental risks

Uzbekistan's main environmental problems are centred on water and agriculture. Besides the Aral Sea, Uzbekistan struggles with water supply and contamination problems throughout the country and the whole region. The agricultural heritage makes land deterioration and contamination Uzbekistan's second largest problem for human security.

The Aral Sea catastrophe dates back to decisions taken by the Soviet Union in the 1960s, when every effort was made to increase cotton production, mainly by increasing irrigation. The necessary water was

tapped from rivers that feed the Aral Sea. This Soviet water management had a series of catastrophic environmental effects, which bear heavily on the region and most immediately affect the autonomous Republic of Karakalpakstan. They include environmental consequences, such as the reduction of the Aral Sea volume to less than half its size, the complete devastation of its ecology and the virtual extinction of fish. Desertification of vast areas, including the Amu Darya and Syr Darya deltas, "is changing the climate in the region" (UN ECE 2001: 64) and has reduced the Sea's vicinity to a lifeless desert. The environmental changes impact directly on the population. The loss of fish has virtually destroyed the previously important fishing sector in the region, leaving 60,000 people unemployed (ibid.).

Desertification and soil erosion cause winds to carry salt and dusts for hundreds of miles to be deposited over cultivated land and in human lungs. An additional threat to health is posed by Vozrozhdeniye Island's history as a test site of the Soviet Defence Ministry (see Box 6). The lack of employment and fear of health risks has led to migration from the Aral Sea region, uprooting people and increasing population density in other areas of the country.

Water quantity and quality are a key concern throughout Uzbekistan. In fact, "the majority of the country's waterways are either moderately or heavily polluted" posing a considerable threat to human health and degrading irrigated land (ibid: 5). Pollution is mainly caused by agriculture, industry and human settlements. The allocation of crucial water supplies has led repeatedly to tensions between Uzbekistan and its downstream neighbours as well as upstream states, leading Uzbekistan to severely reduce its trade and from time to time close its borders.

The legacy of mono-cultivation of cotton along Uzbekistan's river beds, accompanied by heavy irrigation and extensive use of pesticides, has led to widespread salinity and contamination throughout the country and

Water quantity and quality are key concerns throughout Uzbekistan

Allocation of crucial water supplies has led repeatedly to tensions

Uzbekistan has made substantial efforts to increase agricultural diversity

has severely reduced biodiversity. Since independence, Uzbekistan has made substantial efforts to increase agricultural diversity and modify irrigation practices. However, the economic significance of agriculture paired with an increased area of arable land indicates continuing environmental pressure for the ecosystem and humans living within it.

Socio-economic conditions

Agriculture remains a strong economic sector in Uzbekistan, accounting for 30 percent of GDP and 40 percent of employment (World Bank 2001e). Despite continuing drought conditions, cotton yields increased by nearly 10 percent in 2001 and growth in industrial output accelerated to 8.1 in 2001 from 5.8 percent in 2000 (ADB 2002a: 124). Real GDP per capita (PPP) stood at \$2.441 in 2000 and had increased by almost \$200 in each of the previous two years. While small-scale private activity led to a strengthening of the services sectors by 14.2 percent in 2001 (ibid.), Uzbekistan's economy remains highly state controlled, as the repressive import measures in response to a fall in commodity prices in neighbouring states have shown (Swisspeace 2003b: 3). The cost of local consumer goods

often puts them beyond reach for the population (ibid.), due to low incomes and a consumer price inflation rate of 26.6 percent in 2001 (ADB 2002a: 124).

According to official statistics, unemployment is 0.4 percent, "actual unemployment, however, is estimated to be much higher; and hidden unemployment in the rural sector has been rising" (ibid: 125). Lack of transparency, central steering mechanisms and slow economic reform efforts are making their mark on Uzbekistan's economic competitiveness. According to the World Bank, 29 percent of the population was below the national poverty line in 1999 (World Bank 2001e). At the same time, Uzbekistan invests more heavily in its social systems than most countries in Central Asia, with public health expenditure reaching 6.6 percent of GDP in 1999 (UNICEF 2002). The life expectancy of 69 years (2000 figures) is the highest in Central Asia (UNDP 2001). According to UNICEF data of 2000, Uzbekistan's health situation is remarkably good, though environmental causes and especially the 45 million metric tons of salty and contaminated dust spreading from the dried up Aral Sea seabed each year are considered to have a negative health impact (Medecins Sans Frontiers 2000).

Box 6: **Vozrozhdeniye Island**

Vozrozhdeniye Island, the Renaissance or Rebirth Island, is located in the Aral Sea between Kazakhstan and Uzbekistan. As early as 1936, Vozrozhdeniye Island was transferred to the authority of the Soviet Ministry of Defence for use by the Red Army's Scientific Medical Institute. Due to its isolated location, it was used as a test site for biological agents and aerosols, such as anthrax, plague and smallpox between 1952 and 1992. After the site was officially

closed in 1992, military experts from both Russia and the United States have been involved in efforts to decontaminate the area. In October 2001, the U.S. Department of Defense and the Uzbek Ministry of Defence signed an agreement allowing the Cooperative Threat Reduction programme to spend up to \$6 million to destroy residual spores and therefore reduce risks to the environment and human health. The threat of substances buried

in the ground being spread by rodents has increased substantially since the shrinking of the Aral Sea, revealing a connection between Uzbek mainland and the Island, which is gradually increasing.

Sources: Global Security Org 2003; UN ECE 2000a

Uzbekistan's paternalistic economic approach turns repressive and authoritarian where civil society, civil liberties and political rights are concerned. The Freedom House ranking of Uzbekistan remains 'not free', with the civil liberties improving marginally to 6 and political rights remaining at 7, on a scale of 1 to 7. The non-existence of political rights is confirmed by the Limited Election Assessment Mission, which observed the 1999 parliamentary elections instead of a standard Election Observation Mission, due to "serious concerns that the electoral framework in Uzbekistan could not permit a pluralist and competitive election" (OSCE/ODIHR 2000c: 2). They concluded that the electorate had no genuine choice between political alternatives and that "fundamental freedoms in Uzbekistan are severely restricted" (ibid.).

Civil society organizations and NGOs exist, though they are viewed with suspicion by the government and their activity is mainly restricted to uncontroversial topics which are complementary to government concerns. For example, a project by a local NGO in Karakalpakstan aimed at educating women and their families about the important link between environmental issues and human health. With an estimated 7000 people imprisoned for religious or political beliefs (Human Rights Watch, 2002), it is questionable whether alternative views are openly and freely articulated by the wider public.

A lack of public awareness makes it difficult for a large part of the population to adequately and proactively respond to environmental and economic pressures. The potential for the combination of these pressures to result in disorder and conflict is seriously increased by the restrictive measures of the government.

Policies, institutions and capacities

After more than ten years of political, economic and social transition following independence, Uzbekistan still has a rather

autocratic system. Basic democratic structures need to be improved and principles implemented. The observation of the 1999 parliamentary and 2000 presidential elections in Uzbekistan concluded that "the principle of separation of powers between the executive and legislative branches enshrined in the Constitution is not respected" (OSCE/ODIHR 2000c: 4). In general, the state is marked by a centralized authority and hierarchical institutional structure.

Environmental concerns are addressed by the State Committee for Nature Protection, with a total staff of 1864 (UN ECE 2001: 44). It reports directly to parliament, which ensures its genuine independence and signifies the high priority accorded to environmental protection in Uzbekistan. Some environmental functions are fulfilled by the Ministry of Health, the Ministry of Internal Affairs, the Ministry of Agriculture and Water Management and the State Committee for Safety in the Manufacturing and Mining Industries. The socio-economic impacts of environmental stress are dealt with by the Ministry of Economics and Department of Statistics, under the Cabinet of Ministers. Environmental issues are mainly addressed in the National Environmental Action Plan and the National Action Plan for Environmental Protection. Unfortunately, these programmes lack implementation, "including legislative and institutional measures and defined financing" (UNECE 2001: 18). Public participation is regulated by legislation, for example in the environmental sphere by the Environmental Protection Law and Law on Ecological Expertise, but is mainly restricted to scientific expertise consultation. A more general cross-sectoral cooperation of institutions or integration of related policies does not occur in a systematic way.

Uzbekistan's relationships to its neighbouring states have exhibited strong self-isolation tendencies (Swisspeace 2003b: 3). At the same time, Uzbekistan recognizes the need for regional environmental cooperation to reduce security risks deriving from de-

Fundamental freedoms in Uzbekistan are severely restricted

Public participation is mainly restricted to scientific expertise consultation

grading environmental conditions. In autumn 2002, the last remaining border disputes with Kazakhstan were settled. The area of concern had been highly contentious due to its ethnic composition and access to water. Nevertheless, the issue of water allocations remains a source of tension between Uzbekistan and its neighbouring states.

At the same time, Uzbekistan is involved in many regional organizations and projects, such as the International Fund for Saving the Aral Sea, the Interstate Coordination Water Commission, the Regional Environmental Centre, the Aral Sea Basin Capacity Development Project (1998–2001), the Regional Project on the West Tain-Shan Biodiversity Saving (2001–2003) and the Regional Environment Action Plan Development, though the effectiveness of some of these programmes and organizations is severely jeopardized by a lack of clearly defined responsibilities, implemen-

tation schemes and finance. At an international level, Uzbekistan has ratified the United Nations Framework Convention on Climate Change, the Kyoto Protocol and the Convention on Combating Desertification. It has accession status to the Convention on Biological Diversity and the Montreal Protocol on Ozone Depleting Substances.

7 Conclusions

Against the background of the country case studies, we conclude that environmental degradation and resource scarcity have not been sole causes of violent conflict in any of the Central Asian republics, but have exacerbated existing political and social crises and ethnic tensions. Only in the cases of the Ferghana Valley and the civil war in Tajikistan did we find an explicit link between environmental stress and violence.

The Central Asian states face tremendous challenges to manage the process of political, economic and social transformation towards competitive and open market economies. They still suffer in ecological, economic, political and social terms from the Soviet legacy – notably large-scale irrigation systems for agricultural production (mainly cotton monocultures), artificial borders, disruption of historic social and economic structures and mass migration and displacement.

National patterns of environmental risks

In Kazakhstan we found severe impacts on human health through industrial production at a low level of technology. Water pollution, radioactive waste, and industrial pollution in industrial-urban areas are key environmental pressures. Water quality and supply are the major environmental concerns and have been identified as priority areas by the National Environmental Action Plan. The Aral Sea represents a unique disaster with a sequence of devastating environmental and socio-economic effects. Radiation deriving from large geological uranium deposits and uranium mining wastes, in conjunction with the impacts of Kazakhstan having been the nuclear test ground for the former Soviet Union, significantly affects human health. Industry also contributes substantially to pollution caused by improper waste treatment and management.

In Kyrgyzstan, environmental degradation is more closely related to poverty and security,

though only indirectly. High environmental pressure on vulnerable local ecosystems in remote and often mountainous areas is combined with an overall weak governance structure, high population pressure, continuing poverty, and ethnic tensions. However, outbreaks of violence only occur at the sub-state level where the majority of the population lives in poverty. Nevertheless, the Kyrgyz government is the only one in the region that explicitly refers in policies and laws to the linkage between environmental stress, poverty and security risks.

Tajikistan is characterized by ongoing degradation of land resources and limited availability of clean water. A high incidence of poverty and a slowly stabilizing economy, enormous social problems and still insufficient state capacity make the country most vulnerable to environmental decline. Tajikistan is the only country which experienced large-scale violence during the civil war between 1992 and 1997. In contrast to other Central Asian republics, scarce water resources are not a general concern. This is due to the mountainous profile of the country. But water infrastructure, such as the dam in Lake Sarez, is in a poor condition and vulnerable to seismic activity. High susceptibility to natural disasters is caused mainly by high dependency on hydropower and agricultural production.

Turkmenistan is characterized by limited water availability and severe pollution of water bodies due to agricultural and industrial effluent, with large-scale impacts on human health assumed. Although the economy is relatively closed and centralized, Turkmenistan has experienced steady economic growth in recent years. This is attributable to rising agricultural output and the country's huge oil and gas reserves. Nonetheless, the comparatively prospering economy contrasts with extremely limited political rights and civil liberties, a lack of transparency and practically no participatory elements in policy-making. The resource conflicts and ethnic tensions experienced in many other Central Asian

Environmental degradation and resource scarcity have not been sole causes of violent conflict

Central Asian states face tremendous challenges to manage the process of political, economic and social transformation

states are not in evidence, according to official information. High economic growth and subsidies for basic commodities partially accommodate the demands of the poorer part of the population.

Uzbekistan is experiencing the human development impacts of large-scale human interference in fragile ecosystems. The legacy of irrigation for monoculture cotton cultivation and extensive use of pesticides has led to widespread salinity, soil erosion and contamination. The Soviet irrigation system for cotton monoculture generated a series of catastrophic environmental and social effects. Allocation of crucial water supplies has repeatedly led to tensions between Uzbekistan and its downstream neighbouring states. Moreover, the decline of the Aral Sea has caused migration from that region, raising pressures on natural resources in already populated areas.

Security-relevant environmental risks

Key environmental issues threatening human development and security in the region are the growing water demand mainly for irrigation (Kyrgyzstan, Uzbekistan, Tajikistan and Turkmenistan), high levels of water pollution (Tajikistan, Turkmenistan and Uzbekistan), soil erosion and degradation (Kazakhstan, Turkmenistan and Uzbekistan) and air pollution by industrial activities (Kazakhstan and Tajikistan). Differences among countries are considerable but smaller than the differentials between central and peripheral areas within countries.

Water pollution caused by industrial activities, uneven distribution and availability of water resources, land degradation through salinization, and radioactive toxic waste have been identified as major environmental concerns in the region. Water-related problems have been found to have the most obvious but often only indirect impacts on security. Even though there is no general

scarcity of water resources in terms of total water availability at the regional level, water is unevenly distributed. Huge amounts of water are stored in the mountains in Tajikistan and Kyrgyzstan. But even in these countries, high demand for water resources, mainly for irrigation, and water losses due to inappropriate water infrastructure impose significant constraints upon water supply. Allocation of crucial water supplies has repeatedly led to tensions.

Transboundary cooperation on the allocation of water has been the subject of various regional and bilateral negotiation processes and projects in recent years, often resulting in formal agreements, joint commissions and the development of policies and measures. Traditional resource conflicts over shared water resources seem less likely than often assumed.

In contrast to the well known problem of uneven distribution and allocation of water resources, engendered mainly by rising demand for water, the impacts of water pollution have been underestimated. Water pollution affects human health in both urban areas and local communities and water pollution can even provoke transboundary tensions. Freshwater is highly exposed to industrial and agricultural pollution, with concomitant human health effects. Throughout the region, drinking water is frequently, sometimes heavily polluted. Since river basins are shared between numerous states, water pollution is necessarily a regional concern. Other forms of pollution can also affect transboundary relations negatively. For example, air pollution became a point of controversy between Tajikistan and Uzbekistan because the Tajik aluminium factory in Tursunzade is close to Uzbekistan's border and birth defects are unusually high in the region. An agreement has been reached between both governments to resolve the environmental problems associated with emissions from the factory.

Differences among countries are considerable but smaller than the differentials between central and peripheral areas within countries

The impacts of water pollution have been underestimated

Marginalization and economic pressure

Marginalization or uneven distribution of natural resources and large-scale environmental pollution is often combined with heavy economic burdens affecting the poorest communities in the countries. These communities have limited income alternatives, and limited access to public health services and social safety nets. Environmentally triggered or heightened tensions ensue at the sub-state level and in already marginalized and remote areas. Here, scarce natural resources and their intensive use as a source of basic human survival and livelihoods, high levels of pollution (mainly water pollution), soil degradation and overpopulation are engendering major threats to human development and security.

The existing institutional structure is limited and suffers from weak implementation, limited technical capabilities and lacking finance and human resources. Similarly, the legislative and institutional base is largely characterized by sectoral approaches with little or ineffective coordinating structures. There is awareness of the links between environmental stress and human development and security in Turkmenistan and Kyrgyzstan, with 'environmental security' being a key component of national environmental policy strategies. Beyond these normative programmes, however, there is a lack of substantive moves towards considering these links in an integrated fashion.

Weak governance structures

In practically all branches of government, policy reforms depend largely on external assistance. External debt has created heavy burdens; as a result, the pace of reform has slowed. Across all five Central Asian countries, the institutional framework to address environmental risks exhibits similar patterns of weak institutional structure, essentially

building on earlier processes of institutionalization in environmental policy in the post-independence era. Basic competencies have been allocated to several line ministries and basic environmental legislation has been developed. Nevertheless, institutionalization is lacking at provincial and municipal level. Efforts to further develop appropriate legal structures largely depend on funding for pilot projects and general assistance by external donors. Implementation deficits are reported from all countries, being more dramatic at the local level, where government policies rarely have any impact. Even though legal provisions for formal policy coordination and prerequisites for integration exist, practical coordination and integration among government agencies needs improving.

Access to information and public participation in environmental decision-making is a key component of good environmental governance and a substantial element of democratic patterns in open societies. Legal provisions for public participation exist, either in the constitution or the various basic environmental laws. However, access to information and public participation varies significantly. Comparatively autocratic government structures leave little room for active participation.

With regard to civil liberties and political rights, the five countries are similar, all remaining at the bottom end of the Freedom House Index. OSCE/ODIHR assessments of parliamentary and presidential elections confirm that elections do not yet meet international standards.

Environmentally triggered tensions ensue in already marginalized and remote areas

Implementation deficits are more dramatic at the local level

8 Recommendations

Building upon the conclusions set out above, this scoping report proposes enhancing and strengthening capacities and institutions – both of government agencies and civil society – in order to reduce environmental risks and their impacts on human development and security.

Strengthen institutional capacities

Following independence, Central Asian states have made considerable efforts to establish environmental institutions. Apart from the lack of financial means to implement policies, integrative approaches to tackle the impacts of environmental stress on human development and security still need to be improved. Experiences with suitable institutional arrangements for policy integration need to be communicated and, where necessary, adapted to Central Asia at both the national and local level. We suggest concentrating on three main issues of integration: (a) institutional and administrative development, (b) sustainable resource management, conflict prevention and mediation, and (c) regional framework programmes.

First, a survey of institutional options for policy integration should be conducted, assessing existing legal provisions and institutional arrangements for cross-sectoral integration outside Central Asia and identifying the preconditions for adapting them to Central Asia. This relates to the integration of policies on the environment, natural resources, health and social security as well as foreign and security policy.

Second, a survey needs to be conducted in order to systematically analyse the level of integration of environmental concerns in programmes and projects addressing conflict prevention and peace promotion in the region as well as dispute resolution mechanisms and mediation techniques – and, vice versa, the integration of such issues into environmental affairs. Transboundary environmental cooperation has been effective in

achieving regional stability at the political level. Nonetheless, environmental quality, natural resources and social conditions continue their decline in many instances. There therefore remains a need to increase the understanding of institutions and policies which help to effectively address both spheres – the improvement of environmental quality and sustainable resource use and the fostering of regional stability and peace.

Third, it would be expedient to conduct a survey on how to better integrate the socio-economic and security dimension into the Regional Environmental Action Plan (REAP) for Central Asia. REAP is the major regional effort and framework for improving sustainable development and environmental protection in the region. We recommend initiating a dialogue with key proponents of the facilitating and participating stakeholders within the REAP process. This dialogue would tackle issues of policy integration to address environmental risks and their impacts on human development and security.

Improve environmental policies in vulnerable regions

The transboundary effects of resource scarcity – mainly water scarcity – have become the focus of concern for national governments and the international community alike. One effect of this has been that environmental pollution at the national level and its security implications have been largely underestimated. Policies for pollution prevention and control need to be developed and implemented especially in areas with weak governance structures and high levels of social and economic vulnerability.

Conduct integrated assessments

Security-relevant environmental risks arise mainly at the sub-state level where environmental stress and unfavourable socio-economic conditions are exacerbated. Operational

conflict impact assessment tools need to be developed which allow stakeholders especially at the sub-state level to analyse the root causes and triggering and accelerating factors of environmental conflicts. Future assessments should extend beyond single issues such as water stress, ethnic tension or migration and consider these aspects in an integrated manner.

Fact-finding and appraisal missions to regions which have been identified as most prone to affect human development and security may assist in identifying pilot projects which help to address these challenges. They should be carried out in close cooperation with UNDP country offices and OSCE field presences, based on their experience and presence in Central Asia. Fact-finding reports should also identify to what extent these challenges have been or need to be considered by external donor programmes and projects in the region.

Enhance knowledge about local contexts

This scoping report has identified aspects of environmental stress and its impact on human development and security. However, it has also found that important information to assess developments at the sub-state level is unavailable or limited. To increase our knowledge and understanding of the complex interplay between environmental stress and human development and security, in-depth analysis at the national and local level is essential. Case study reports should be carried out by twinning teams of external and in-country experts and stakeholders. To ensure comparability, they should use a common methodology and follow a similar structure and approach. These reports should be embedded in a consultative process at the national level, including workshops with representatives of government, civil society and UNDP country offices and OSCE field presences.

Develop early warning indicators and monitoring systems

Indicators of environmental stress and socio-economic conditions are only available at the national level and are insufficient to serve the purpose of establishing an early warning system. Based on existing early warning systems for environmental stress, health, economic performance and social development and integrated early warning mechanisms, relevant data need to be collected systematically at the local level. These data can provide the basis for regular assessment reports on local hot spots to be conducted by local stakeholders. Existing Peace and Conflict Impact Assessments may serve as examples. As a first step, pilot regions need to be identified in cooperation with national and local stakeholder groups, and external donor agencies need to be integrated into a comprehensive and continuous monitoring system for environment and security in Central Asia.

Communicate success stories

Peace and conflict impact assessments and environmental performance reports focus predominantly on analysing tensions, conflicts and environmental decline. However, there are several examples of successfully mitigated or solved conflicts and tensions which had emanated from environmental decline. Information on success stories, especially at the local level, are rarely available to the public and donor agencies. Lessons from successful local projects and transboundary environmental cooperation creating mutual benefits in environmental, social and economic terms should be systematically analysed and communicated. A compilation of successful approaches in best practice manuals can provide guidelines for decision makers at the national and local levels. These should contain recommendations on institutional settings and procedures which proved successful, enabling decision makers to

transfer these approaches to other regions and problem areas.

Facilitate consultation and ownership

Lack of civil society participation in decision-making and access to information has been identified as a major constraint to effectively addressing environmental risks and their impact on human development and security. This scoping report should be distributed widely and discussed with national and local stakeholder groups in the respective countries. It would be useful to facilitate national stakeholder dialogues, which can then be developed further into regular regional round tables. Awareness needs to be raised of the potential of the link between environmental risks and unfavourable socio-economic conditions to threaten human development and security. Consultative workshops with representatives of donor agencies, including UNDP country offices and OSCE field presences, will provide information on how best to tackle these challenges and help governments and civil society groups identify and focus on areas of concern.

Raise awareness and foster transboundary networks

Raising awareness of environment and security linkages and agreeing on areas for further environmental cooperation will largely depend on the availability and transparency of information. A comprehensive information system and network should be established which contains integrative regional, national and local assessment reports and analyses. It may also serve the purpose of policy coordination, especially among donor agencies, by facilitating information on donor programmes and projects which jointly address the environment and security linkages in Central Asia. Regular policy briefs and manuals on policy development and implementation

can foster transboundary learning processes within the region. A web-based information system in English and Russian will enable stakeholders to share experience on successful approaches and will facilitate contacts among local stakeholders and external expert bodies, NGOs and government agencies.

Since most of the vulnerable regions are in remote areas with no access to modern communication technologies, where policy briefings and manuals may be inappropriate means for reaching local communities, other methods and means of communication need to be applied.

The allocation of environmental assets as basic resources for human development and security carries an important transboundary dimension, as does environmental pollution. It would be valuable to create transboundary networks bringing together representatives of national government agencies and civil society groups. Here they could exchange information and experience on addressing and mitigating environmental problems and their socio-economic impacts. This can enhance cross-border learning processes on sustainable resource management in addition to improving socio-economic conditions.

Improve donor coordination

National and regional donor round tables should be organized to share information and coordinate assistance. An initial donor round table should address the challenges identified in this scoping report and facilitate a dialogue among donor agencies on sustainable resource management and human development and security. One topic of discussion will need to be how best to integrate these issues in donor assistance programmes for the region. Past approaches by national donor agencies may be taken as examples to analyse conditions for success as well as barriers and constraints to integrative approaches, extending beyond sector-specific projects.

Develop training programmes

Training programmes on sustainable resource management and dispute resolution and prevention techniques should be developed and carried out in the areas most prone to conflicts and tensions. Training programmes need to be tailored specifically to the requirements of local communities, recognizing that technical capacities in often remote areas are limited. To sustain such training programmes, the development of appropriate manuals and the training of trainers are essential elements.

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United Nations Development Programme (UNDP) in Europe and the Commonwealth of Independent States (CIS)

UNDP's Regional Bureau for Europe and the Commonwealth of Independent States (RBEC) administers programmes in Central and Eastern Europe and the Commonwealth of Independent States, playing an important role in the transition process through empowering people, organizations and governments to promote sustainable human development. RBEC links and coordinates regional and national efforts to reach the Millennium Development Goals.

There are UNDP local offices in 23 countries of the region (Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Yugoslavia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, The Former Yugoslav Republic of Macedonia, Moldova, Poland, Romania, Russian Federation, Tajikistan, Turkey, Turkmenistan, Ukraine and Uzbekistan.) Each pursues its own priorities dictated by the local situation but they all have in common the pursuit of excellence in the six practice areas: democratic governance, poverty reduction, crisis prevention and recovery, energy and environment, information and communications technology, and HIV/AIDS.

The RBEC Regional Support Centre (RSC) was established in 1997 in Bratislava, Slovakia, as a knowledge and management hub. It provides management support services for all programme countries in the region and administers programmes also for countries where UNDP has no local presence (Czech Republic, Hungary, Malta, Slovak Republic, Slovenia and St. Helena). In addition, RSC is also home to a Sub-Regional Resource Facility that provides policy advice, knowledge and expertise to the governments of the region as well as to civil society.

RSC regional activities focus on the three inter-linked governance themes and priorities: democratic governance, economic governance, and environmental governance. Within this framework, the regional programme addresses the following issues: protecting and promoting human rights; ensuring transparency, accountability and anti-corruption policies; decentralising and deconcentrating power; addressing the complex intersections between conflict prevention and early warning as well as conflict mitigation and post-conflict recovery; promoting equity in development; combating HIV/AIDS; and integrating Information and Communication Technologies as an instrument for development.

The environmental governance programme of the Bratislava Regional Support Centre promotes sustainable environmental policies and practices in the RBEC region. It focuses on the following thematic areas:

- Development and implementation of environmental policies and strategies, and strengthening of the legal and institutional frameworks
- Integration of environmental concerns into regional and sectoral development plans
- Ecosystem resource management and
- Environmental security.

The environmental governance programme is key to RBEC's pursuit of Millennium Development Goal Number 7 ("Ensure environmental sustainability"), and particularly of targets related to governance of water resources.

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